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AN APPENDIX ABSCESS IN A 27-MONTHS' CHILD; WITH AN ANALYSIS OF INFANTILE APPENDICITIS IN THE JOHNS HOPKINS HOSPITAL.

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Appendicitis in children has received a good deal of consideration in the literature; but the word "children" has been used in rather a vague way; deductions have been drawn from statistics including young adults, and separate attention has hardly been called to the extremely interesting class of cases occurring in *very young* children. These cases of infantile appendicitis are strikingly rare, considering the great frequency of the disease a little later in life; and it is not easy to gather from the literature statistics that allow of definite conclusions as to the features of the disease in the first five years of life. The present case—the youngest patient operated on for appendicitis in this hospital—belongs in this class; and is of interest both from a diagnostic and a therapeutic standpoint. In connection with the report of the case an analysis of infantile appendicitis in The Johns Hopkins Hospital has been made. These cases were all treated on the surgical service of Professor Halsted, through whose kindness I have had access to the records.

CASE 1.—Surgical Nos. 22,502 and 22,588, male, age 27 mos., June 9, 1908.

First admission: Painful urination; Xray suggestive of vesical calculus; abdomen negative; sounding of bladder showed no stone; recovery.

The patient was brought to the hospital because of painful micturition. The mother stated that urination had been frequent and painful for a year; but five days before admission the trouble became acute and child went a whole day without voiding, crying most of the time. On the fourth day before admission, the urine had to be drawn in the Johns Hopkins Dispensary where a diagnosis of vesical calculus was made. On admission the abdominal examination was negative; temperature 99.2° F., pulse 145. An Xray photograph was taken, which showed a faint shadow suggestive of vesical calculus. The child's bladder was, therefore, searched under ether; but no stone was found. After the searching the urinary symptoms disappeared and the child was discharged in a week perfectly well.

Second admission (to the Mt. Wilson Sanitarium): Gastroenteric symptoms with fever; abdominal tenderness, becoming localized in right side; no vomiting or urinary symptoms.

One week after leaving the Johns Hopkins Hospital the patient was taken to the Mt. Wilson Sanitarium for the summer. During the week he had "abdominal cramps and fever" and on admission his temperature was 103.4° F. He soon began to give evidence of abdominal pains. The abdomen became tender—more particularly on the right side; and on the fifth day muscle spasm was present, and a probable diagnosis of appendicitis was made. The differential leucocyte count showed: polymorphonuclears 79 per cent; small mononuclears 13 per cent; large mononuclears 7 per cent; eosinophiles 1 per cent. There had been no vomiting and no urinary symptoms.

Third admission (to the Johns Hopkins Hospital): Acute perforative appendicitis with abscess; history and examination typical; no urinary symptoms. Appendectomy and drainage; recovery.

On admission the examination was more satisfactory than is usual in such young patients. The whole abdomen was tense, and there was some tenderness on the left side; but in the right iliac fossa there was definite and exquisite tenderness. No mass could be made out. The percussion note was tympanitic but was somewhat diminished in the lower right quadrant. No rash was present and examination of the throat was negative. Temperature 102.5° F.

Operation: (Dr. Churchman). Under ether a mass could be felt in the right iliac fossa. A right rectus incision was made. There was no free fluid in the peritoneal cavity. After walling off of the general cavity a large abscess was broken into, which lay external to the cecum, ran upward and backward toward the flank, but only a small distance down into the pelvis. The abscess was thoroughly evacuated and the necrotic appendix readily found. Its base was intact and it was ligated with catgut and excised. No attempt was made to invert the stump. The abscess was drained through the rectus incision and also through a counter incision in the flank. For the first few days after operation the child was quite ill. His temperature on the second day reached 104.2° F., and his pulse continued between 140 and 180. Feeding was started 12 hours after operation, one dram of warm milk with lime water being given every two hours. This was soon increased in amount and albumen given on the third day, after the bowels had moved well with enemata. In spite of the continued high temperature and pulse, the abdomen was free from tenderness. There was, however, some distension which was relieved by enemata and stupes. There was no nausea or vomiting. The bowels were quite free (8 stools on the fourth day), but the character of the movements indicated that the food was being well digested. It was thought that the high pulse might in part be due to the iodoform drains; a whiff of chloroform was therefore given, the drains removed and plain gauze re-inserted. The temperature and pulse fell slowly during the next few days, but it could not be demonstrated that this had any connection with the removal of the gauze. On the ninth day the temperature was normal; and on the twenty-seventh day the child left the hospital well. He was seen in the out-patient department one week later with symptoms of a partial obstruction; but the bowels moved well with an enema and on the next visit, two weeks later, he was quite well.

The interesting clinical features of this case were:

a. The youth of the patient (27 mos.).

b. The predominance of urinary symptoms and the original diagnosis of vesical calculus.

c. The high pulse and temperature for several days after operation with negative abdominal condition, suggesting the possibility of iodoform poisoning and the probable wisdom of using plain gauze rather than iodoform gauze in young infants.

d. The rapid and uneventful convalescence after the early postoperative reaction.

There have been 8 other patients under 5 years of age operated on in the surgical clinic of this hospital for appendicitis; and in view of the rather unsatisfactory condition of the statistics in the literature brief outlines of the histories of these cases are here given and an attempt made in this way and by an analysis of the 9 cases to stop the statistical gap.

Case 2.—Surgical No. 3432, female, age 3½ years, September 23, 1894.

Appendicitis simulating tuberculosis of the hip; no abdominal but exclusively joint symptoms. No "attacks." Direct incision and drainage of abscess. Perforation in cecum; spontaneous closure of fecal fistula.

History.—First symptom noticed was a right-sided limp three weeks before admission; no other history; patient brought to hospital for the limp. Examination under ether showed a markedly flexed right leg with great muscular spasm; and considerable lumbar lordosis. Leg was put up in extension, on a diagnosis of tuberculous arthritis. Extension removed after 10 days. Temperature then rose (103.5° F.), but the child complained of nothing. About three weeks after admission, the child then complaining of pain in groin and back, an abscess was opened just above Poupart's ligament and about one ounce of fecal pus removed. Three days later a counter-opening was made along the iliac crest. The child failed to improve and the wound was again explored by Dr. Halsted, and a perforation found in the cecum, which was not repaired. Appendix not found. Convalescence perfect; fecal fistula closed spontaneously.

This case emphasizes again the difficulty of diagnosis and illustrates one of the common errors in differentiation. Even under ether, the flexion and abduction, with muscle-spasm, were so typical as absolutely to mask the real condition. The history, too, was quite unlike that of appendicitis in adults.

Case 3.—Surgical No. 5434½, female, age 4 years, December 18, 1895.

Acute appendicitis without perforation or gangrene. Acute general peritonitis and general streptococcic infection. Death on table.

History.—Habitual constipation. Three weeks before admission, general abdominal pain, with tenderness, distension and constipation. Temperature 101° F. Bowels moved with cascara and symptoms disappeared. Second similar attack one week later. Two days before admission sudden attack of "cramps" in legs and arms, which disappeared in a few hours; next day temperature 104.8° F., but no pain. Temperature rose to 105.8° F., pulse 140; abdominal pain increased, bowels moved with cathartic, vomited once during the night; worst pain complained of is in the epigastrium. Leucocytes 32,000. Transferred from medical to surgical side with every evidence of general peritonitis and in very critical condition.

Operation: Dr. Bloodgood. Appendectomy. Peritoneal cavity contained bloody-serous fluid with fibrin flakes, from which streptococcus was grown. Appendix injected but not perforated. Death on table. Cultures at autopsy showed a general streptococcus infection.

This was an interesting case of streptococcic septicæmia, and general peritonitis, with no other discoverable cause than an unperforated appendicitis and entero-colitis. The development of the condition while the patient was under careful observation emphasizes the difficulty of diagnosis in children.

Case 4.—Surgical No. 15,382, male, age 3 years, October 31, 1903.

Acute perforative appendicitis with spreading peritonitis; typical attack with classical manifestations, including urinary symptoms; appendectomy and drainage; uneventful recovery.

History.—Onset 68 hours before admission with cramp-like general abdominal pain, later localized in right iliac fossa; vomiting, constipation, explosive and frequent urination; temperature 101° F.; leucocytes 40,000.

At operation (Dr. Finney) a rectus incision was made, and turbid fluid encountered in the peritoneal cavity.

Appendix was perforated nearer the tip than the base; considerable turbid fluid in the pelvis. Usual appendectomy (ligation with catgut and careful closure of serosa over stump) with drainage. Rapid and uneventful recovery.

In spite of the typical history of this case the note is made in the record that "on account of the patient's age diagnosis was difficult."

CASE 5.—Surgical No. 16,636, male, age 4 years, September 5, 1904.

Acute perforative appendicitis with general peritonitis; typical attack with vague urinary symptoms; appendectomy and drainage; intestinal obstruction; enterostomy; death on eleventh day; at autopsy an abscess on left side.

First symptoms 60 hours before admission; general abdominal pain, becoming localized in right iliac fossa; vomiting; constipation; difficult urination on day before admission. Temperature 103.2° F.; leucocytes 7300; general symmetrical distension, limitation of respiratory movements and positive signs of general peritonitis.

Operation (Dr. Sowers). Right rectus incision; foul smelling turbid fluid throughout peritoneum; appendectomy and drainage. Later, intestinal obstruction; enterostomy. Child lived for 10 days with a continual fever, distension, occasional vomiting; right-sided pneumonia and pleurisy on ninth day. At autopsy an abscess found in the left side.

There were no features in this case differentiating it from a similar condition in an adult.

CASE 6.—Surgical No. 17,232, male, age 5 years, January 9, 1905.

Acute gangrenous appendicitis with early abscess; typical attack without urinary symptoms; appendectomy and drainage; post-operative obstruction (nineteenth day); enterostomy; recovery.

History.—First symptoms four days before admission; attack quite typical as regards abdominal pain, vomiting, distension and constipation; no urinary symptoms. Examination showed tenderness and rigidity without muscle spasm in the lower right iliac fossa; no mass felt. Temperature 102.3° F. Leucocytes 11,000.

At operation (Dr. Follis) a right rectus incision was made and the peritoneum opened just at the edge of an early abscess, which was ruptured in the attempt to wall off the intestines; a large amount of foul pus escaped; the abscess was large, extending up to the liver and down into the pelvis on the right side and also into the left side of the pelvis, the appendix was gangrenous at its tip, as was the cecum at its base. Appendectomy and drainage; loop of bowel left in wound. Fairly quiet convalescence, though catheterization was necessary on the fifth day; gradually developing intestinal obstruction on nineteenth day, requiring enterostomy, after which round worms were passed by mouth, through fistula and in stools.

The clinical features of this case were typical and the diagnosis presented no difficulty. The bladder symptoms on the fifth day, and the late occurrence of intestinal obstruction associated with ascaris lumbricoides were the interesting features. Two uncles had been operated on for appendicitis.

CASE 7.—Surgical No. 17,836, male, age 5 years, June 3, 1905.

Acute perforative appendicitis with abscess; attack characterized by marked central nervous system symptoms (cerebro-spinal meningitis?); appendectomy and drainage; recovery.

History.—Patient admitted to hospital with clinical diagnosis of cerebro-spinal meningitis; the disease started two weeks before admission with vomiting; 12 hours after onset a convulsion, with unconsciousness and jerking of arms and legs; head was retracted and child often raised hand to head as if in pain; child was not able to speak after the convulsion, but apparently understood what was said to him; at times motioned to his abdomen as if in pain; no urinary symptoms; temperature 100.5° F., leucocytes 11,200. Patient in semi-comatose condition on admission, but apparently understood what was said. Condition suggested meningitis, but Kernig's sign was absent, lumbar puncture showed no increased tension and fluid obtained was sterile. There was a mass in the right iliac fossa, over which there was tenderness and muscular rigidity.

At operation (Dr. Watts) a large bi-locular appendix abscess was found extending into the pelvis, where the appendix lay. It was ligated and amputated, but the carbolized stump was not inverted. Iodoform gauze drainage. For the first few days after operation, there was great restlessness, and muscular twitching; right arm moved about uncontrollably. The head was retracted and the neck held stiff. Patient was unable to speak. These symptoms, however, gradually disappeared, speech returned and on the 45th day patient was discharged well.

This case was a most unusual one. Abdominal examination made the existence of an appendix abscess certain; but the onset of the disease was atypical, and the cerebral picture difficult to explain. A cerebral palsy of infectious origin was thought of (Dr. Cushing). That the two conditions were not independent seems certain from the simultaneous onset of the abdominal pain with vomiting, and the curious cerebral symptoms; as well as from the disappearance of the latter after the operation.

CASE 8.—Surgical No. 18,562, male, age 4 years, December 14, 1905.

Acute appendicitis with abscess; clinical features typical; incision and drainage of abscess; appendix not removed. Second attack with abscess 22 months later; incision and drainage of abscess; appendix not found. Third attack four months later with large abscess in the left iliac fossa; incised and drained through the mid-line; partial intestinal obstruction; laparatomy, freeing of adhesions, appendectomy, drainage; recovery.

History, First Admission.—Onset one week before admission with typical features, but no urinary symptoms. Patient admitted with general abdominal distension; a large spherical mass just to the right of and a little below the umbilicus; temperature 99.8° F.; leucocytes 15,700.

Operation (Dr. Sowers). Right rectus incision just median to the abscess which was opened after packing off the general cavity. A large amount of pus evacuated; appendix not sought for; iodoform gauze drainage; Uninterrupted recovery. Twenty-two months later, an abscess again developed which was opened and drained (at Elkins, W. Va.); appendix not found.

Second Admission.—Marked feature since the first admission was obstinate constipation. The present attack began four days before admission, and the features were typical; no urinary symptoms were present. The child was quite ill on admission; temperature 99.8° F.; leucocytes 24,000. The whole lower *left* quadrant was occupied by a tender, resistant mass which could be felt per rectum.

Operation (Dr. Churchman). A mid-line incision was made, the abscess opened directly, evacuated and drained (counter incision in flank). Patient did very well until the 15th day when definite signs of a partial obstruction appeared, with visible peristalsis.

Laparotomy (Dr. Churchman). Right rectus incision; adhesions of bowels separated, and partial obstruction freed; appendix removed (tip lay in pelvis); loop of bowel left in wound for enterostomy. Patient vomited round worms the night after operation. Obstruction disappeared, no enterostomy was needed and recovery was uneventful.

The abscess of appendicial origin appearing on the left side (evidently remains of an old horse-shoe abscess) was of interest

in this case. The repeated attacks and the excellent way in which the child stood the four successive operations are to be noted. Absence of bladder symptoms in spite of the large pelvic abscess on both sides was striking. The late occurrence of intestinal obstruction associated with ascaris lumbricoides should be kept in mind in connection with Case 6.

Case 9.—Surgical No. 20,299, male, age 5 years, February 12, 1907.

Acute recurrent unperforated appendicitis; history typical; free fluid in peritoneum, but appendix nearly normal in appearance; appendectomy and closure; recovery.

History.—Onset 30 hours before admission; clinical features characteristic, but no urinary symptoms. Patient had had a similar attack six months before admission, which lasted only one evening, but was accompanied by vomiting. There was slight resistance over the right half of the abdomen, but no muscle spasm or rigidity. The abdominal condition was, indeed, nearly negative; temperature 101.4° F.; leucocytes 8000.

Operation (Dr. Finney). McBurney incision. A considerable amount of clear, free fluid was found in the peritoneum. Appendix so normal in appearance as to make the diagnosis doubtful; but exploration of the other viscera was negative. Appendectomy and closure. Rapid and uneventful convalescence.

The interesting features of this case were the recurrent attacks and the presence of free fluid with an appendix nearly normal macroscopically. The case was a striking illustration of the tendency of the infantile peritoneum to react with an effusion of fluid to slight inflammations. It was really a spreading peritonitis seen in its incipiency and shows how such a condition may develop without gross lesion of the appendix (cf. Case 3, in which a general purulent peritonitis of appendicial origin existed without macroscopic perforation of the appendix.) Microscopic examination of the appendix showed a definite early inflammation of the mucosa.

Two other appendectomies in infants under 5 years done in this hospital may be here recorded. About 100 cases of inguinal hernia containing the appendix (a condition first noticed by Morgagni) are reported in the literature; and of these about 23 per cent were observed during childhood. The two cases here reported throw no light on the clinical side of infantile appendicitis, for in both the appendix was practically normal; they should, however, be included in the series as they influence the conclusions to be drawn as to the seriousness of appendectomy in young infants.

Case 10.—Surgical No. 17,142, male, age 19 months, December 17, 1904.

Right acquired indirect inguinal hernia, strangulated; the sac contained free fluid, loops of strangulated, but not gangrenous, ileum and the cecum with appendix; the hernia was readily reduced, the appendix removed in the usual manner, its stump inverted, and a radical cure of the hernia done. Convalescence was uneventful.

Case 11.—Surgical No. 20,423, male, age 3 years, April 3, 1907.

Right acquired indirect inguinal hernia; sac contained cecum and appendix; appendectomy and inversion of stump; radical cure of hernia; convalescence uneventful.

The Frequency of Infantile Appendicitis.

It has long been well known that appendicitis was a disease of young adults and that it was relatively infrequent in children; but if one consults the statistics in the literature one finds difficulty, on account of the vagueness of the terms used, in determining just *how* infrequent the disease is in the early years of life. Furthermore, there has been little effort made to separate the appendicitis of *children* (which as a matter of fact is not rare at all but only slightly less frequent than the appendicitis of young adults) from the appendicitis of *infants*, a condition infrequent enough to be always of interest. The figures, for instance, of Miss Gordon's Paris thesis (L'Appendicite chez L'Enfant) are widely quoted in the literature; yet of the 78 cases for which histories are given, only 5 were in the first 5 years of life, a majority were in the second decade when, as a matter of fact, appendicitis is nearly at its maximum frequency, and one history is included of a lad of 19. Deductions from such statistics have no true bearing, of course, on infantile appendicitis. The word "children" is used in a sufficiently vague way elsewhere in the literature and for this reason the statistics are most unsatisfactory. Sonnenburg, for instance, says that 20 per cent of the cases occur "in children"; Karewski, that 42 per cent occur before puberty; and Sahli that the disease is as frequent "in children" as tonsillitis. In Landouzy's clinic at the Hôpital des Enfants-Malades in Paris, from 1871-1883 only 26 cases of appendicitis were recorded under 14 years of age among nearly 50,000 "children"; and in Henoch's Clinic at the Charité in Berlin, only 2 cases were seen between 1890 and 1894, out of nearly 3000 "children" treated. From the Kaiser & Kaiserin Friedrich Krankenhaus in Berlin, the following statistics were given out:

1890.....	494	patients	treated;	no	appendicitis;	
1891.....	415	"	" ;	"	"	
1892.....1692		"	" ;	3	cases of appendicitis;	
1893.....2232		"	" ;	4	"	"
1894.....2580		"	" ;	8	"	"
Total...7413		"	"	15	"	"

or a percentage of only .202+. In general, as Karewski points out, the disease has been very rarely recognized in hospitals where there is no operating done and more frequently seen in surgical clinics.

In the records of the Johns Hopkins Hospital there are complete histories of 1223 cases of appendicitis. These I have analyzed, as regards the age of the patients, by considering the cases in 5-year groups or pentads. Cases falling in the first pentad (i. e., in the first 5 years of life) are called infantile appendicitis; cases falling in the second and third pentads (i. e., between the 6th and the 15th year inclusive) are called appendicitis in childhood; cases falling in the 4th, 5th and 6th pentads (i. e., between the 16th and 17th year inclusive, or the period of maximum frequency), appendicitis in young adults. This paper is concerned chiefly with infantile appendicitis, i. e., appendicitis occurring in the first 5 years of life. The results of this analysis are as follows:

	Pentad.	Years (inclusive.)	No. of cases.	Percentage.
Infantile Appendicitis ...	1	1- 5	9	.735
Appendicitis in Childhood	2	6-10	50	4.+
	3	11-15	140	11.44
Appendicitis in Young Adults..	4	16-20	199	16.27
	5	21-25	255	20.85
	6	26-30	196	16.02
	7	31-35	112	9.15
	8	36-40	98	8.01
	9	41-45	68	5.56
	10	46-50	34	2.78
	11	51-55	26	2.12
	12	56-60	18	1.47
	13	61-65	10	.817
	14	66-70	2	.163
	15	71-75	5	.409
	16	76-80	1	.082
		81-100	0	.000
			1223	

From these figures may be constructed the following curve of frequency (Chart I):

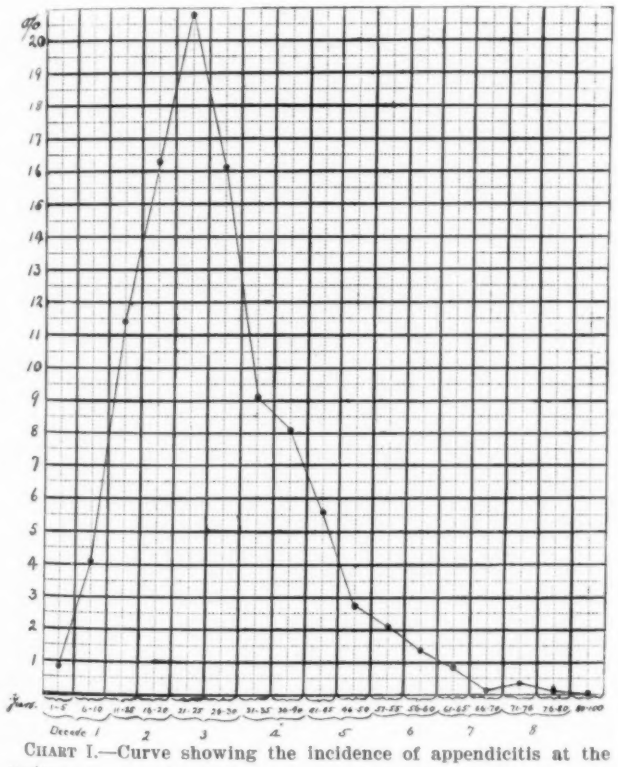

CHART I.—Curve showing the incidence of appendicitis at the various ages, constructed from an analysis of 1223 cases treated in the surgical clinic of the Johns Hopkins Hospital. The figures on the left indicate percentages; those below, the years of life.

From this chart it will be seen:

a. That appendicitis is most frequent between the 21st and the 25th years (20.85 per cent of the cases).

b. That appendicitis in childhood is not a rare but a very frequent disease, nearly 16 per cent of the cases occurring between the 6th and the 15th years.

c. That the curve of frequency assumes a nearly symmetrical form; rising rapidly to its summit in the 5th pentad, falling just as rapidly to the 10th pentad and then more gradually dropping to practically zero after the 65th year.

d. That infantile appendicitis is a rare disease.

A somewhat similar table has been published by McCosh, representing an analysis of 1001 of his own cases:

Pentad.	Years.	No. of cases.	Percentage.
1	1- 5	17	1.7
2	5-10	51	5.1
3	10-15	85	8.5
4	15-20	113	11.3
5	20-25	176	17.6
6	25-30	176	17.6
7	30-35	149	14.9
8	35-40	99	9.9
9	40-45	65	6.5
10	45-50	35	3.5
11	50-55	15	1.5
12	55-60	11	1.1
13	60-65	6	.6
14	65-70	2	.2
15	70-75	1	.1
	75-100	0	.0

From these figures I have constructed a second similar frequency curve (Chart II).

This curve will be seen to be strikingly like the one (Chart I) representing the statistics of this hospital; so that the two charts (representing a total of 2224 cases) may be taken to present the facts as to the age incidence of appendicitis. They *really* represent, rather, not the frequency with which appendicitis *occurs* at the various ages, but the frequency with which it is recognized in a large general hospital. The difficulty of diagnosis is, of course, nowhere so great as in the infantile cases; and it seems very probable that the figures here given (.735 per cent in The Johns Hopkins series, 1.7 per cent in the McCosh series) are far below what they would be if the diagnosis in the first 5 years of life were as simple as it is in adults. It is interesting in this connection to compare a table (taken from Manley's article) which shows the proportion of *deaths from infantile appendicitis* to the *total number of deaths from appendicitis* in a large city (New York).

Year.	Total deaths from Appendicitis.	Deaths from Infantile Appendicitis.[1]
1890	87	4
1891	83	4
1892	129	4
1893	87	2
1894	117	4
1895	182	17
1896	201	8
1897	193	6
1898	252	8
1899	306	18
	1637	75 = 4.58%

[1] In this table the figures given include only children *under* five, and, not as in the previous tables, children between one and five inclusive. Inclusion of the five-year-old children, which would make the table exactly comparable to the previous ones, would, of course, increase the percentages here given.

Clinical Features of Infantile Appendicitis.

It is quite unnecessary to enumerate the well-recognized marks of appendicitis which characterize the disease as it occurs in childhood. All that has been said as to the difficulty of the diagnosis in children may be said a good deal more forcibly of appendicitis in infants; and it is in this place only necessary to state the clinical features which the study of the Johns Hopkins cases brings out.

a. *Sex.*—Six of the patients were males, three females. It is interesting to find the predominance of the disease among males obtaining in infancy. The usual explanations offered for this fact in adults (greater liability of the male sex to exposure and to trauma, greater tendency to errors in diet and

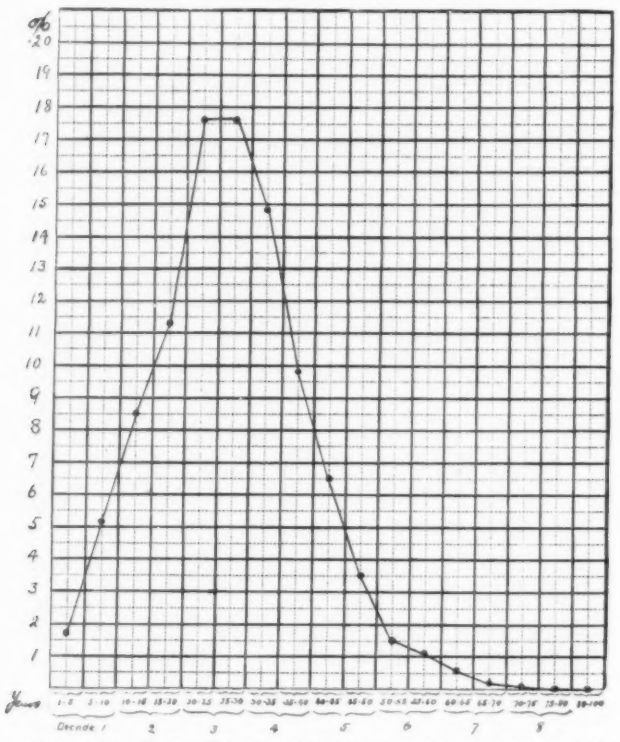

Chart II.—Curve showing the incidence of appendicitis at the various ages, constructed from an analysis of 1001 cases published by McCosh. As in Chart I, the figures on the left represent percentages; those below, the years of life.

frequency of digestive disturbances due to the excessive use of tobacco) can hardly be suggested as accounting for the predominance among infants.

b. *Heredity.*—There is no note in the histories of our patients as to the occurrence of other cases in the family, except that two uncles of Case 6 had been operated on for the disease.

c. *Previous Attacks.*—Five cases gave no history of previous attacks; in all of these the appendix was perforated. One of the five cases had general peritonitis, one had a spreading peritonitis, two had abscesses and one a gangrenous appendix with beginning abscess. So that the disease was of a severe type when first recognized. One patient (Case 9) had had a typical attack 6 months before admission; another (Case 3) had had two such attacks, and another (Case 8), was admitted 2 years after the first stay in the hospital for his third attack, and a fourth (Case 1) was treated in this hospital for vesical calculus during what was probably his first attack of appendicitis.

d. *Diagnosis.*—In three of the cases the signs and symptoms were typical and the diagnosis offered no difficulty. This was also true of Case 1 on the second admission. Four of the cases presented interesting diagnostic difficulties.

Case 2.—This case was taken to be *tuberculous arthritis* and treated as such for nearly 3 weeks. There had been no symptoms before admission except a right-sided limp. Even under ether, the signs were those of a joint-involvement; and the diagnosis was only made when an abscess, containing fecal pus, formed above Poupart's ligament.[2]

Case 3.—In this patient a *general fibrino-purulent peritonitis* developed in less than 48 hours after the first symptom and while the patient was under observation. There is no note of any urinary symptoms; flexion of the thigh first appeared about 40 hours after the onset and about 6 hours before the operation, which revealed a general peritonitis. The diagnosis was simple when the disease had become severe; in the early stage it was difficult. But the progress of the condition was so rapid that the patient reached the surgeon too late.

Case 7.—The history was suggestive of *cerebro-spinal meningitis,* as were many of the signs on admission. There was, however, a definite mass in the right iliac fossa and the diagnosis of appendicitis was positive. The peculiar nervous manifestations seem to have been infectious in origin and it is probable that the whole symptom complex was a manifestation of the appendicitis.

Case 1.—The first diagnosis was *vesical calculus.* Not only were urinary symptoms the *only* symptoms, but abdominal examination was negative, the Röntgen picture suggestive and the temperature normal. The probable sequence in this case was as follows: An acute appendicitis, with obscure onset but characterized pathologically by a slight pelvic peritonitis causing bladder symptoms; subsidence of the attack; second attack with rupture—probably near the cecum; formation of abscess, which did *not* extend into the pelvis (hence absence of bladder symptoms on third admission).

Inasmuch, then, as an appendicitis of the severest type may be present in children without one of the classical symptoms and even a general peritonitis may develop under careful observation, it is perhaps not unwise to call attention again to the occurrence of infantile appendicitis, that those who see many infants may be constantly on their guard. At present, on account of the difficulty of diagnosis and the fulminant character of the disease, only the severest cases come to surgery; yet even for these (as will be seen below) surgery can do a good deal. It could do much more if the diagnosis were

[2] No measurements were made, and no Röntgen photograph was taken.

made early.[2] *All urinary symptoms in children should suggest the possibility of appendicitis, and in infants with apparent hip-joint disease, particularly if the thigh be flexed, the same possibility should be kept in mind. "Cathartics should never be given for constipation unless it is certain that appendicitis is absent; all cases with abdominal pain should be regarded as appendicitis until proven otherwise and cathartics avoided"* (Karewski). *Palpable resistance on the right side by rectal examination is one of the most frequent findings; Selter goes so far as to call it absolutely constant. The importance, therefore, of rectal examination in any doubtful case is obvious.*

THE PATHOLOGY OF INFANTILE APPENDICITIS.

It is well-known (the fact will be referred to again when speaking of the mortality of the disease) that appendicitis in children presents certain pathological features which distinguish it from the same disease in adults. These are: a. The tendency to early perforation; and b. The frequency of spreading peritonitis. Whether this state of affairs has a purely anatomical basis in the thinness of the infantile appendicial mucosa, or is merely due to the fact that most of the less severe cases go unrecognized and only those with perforation and spreading peritonitis are frequently seen, there is quite general statistical agreement that the disease is much oftener diffuse in infants than in adults. In the 9 Johns Hopkins cases the following pathological conditions were found:

General peritonitis, without perforation of appendix,	1 case	2 cases
" " with " " "	1 case	22.22%
Circumscribed abscess	4 cases	44.44%
Spreading peritonitis	1 case	11.11%
Early abscess (i. e. adhesions had begun to wall the inflammation off; but these were so delicate that it was impossible to operate without breaking them up and practically producing a spreading peritonitis)	1 case	11.11%
Unperforated appendix with free serous fluid about it	1 case	11.11%

In only 2 of the 9 cases (22.22 per cent) was the appendix unruptured; and in one of these (Case 3) a streptococcus fibrino-purulent peritonitis and general streptococcus septicæmia were present.

Intestinal obstruction occurred in 4 cases (44.44 per cent). In two of these (22.22 per cent) it was complete and required an enterostomy; in a third case, laparotomy and freeing of adhesions was sufficient; and in the fourth the partial obstruction was promptly relieved by enemata. In two of the 4 obstruction cases the obstruction was associated with the presence of ascaris lumbricoides; in one case (Case 8) the worms were vomited after a laparotomy and freeing of adhesions had been done; in the other case (Case 6) the worms were vomited, passed by rectum and through the enterostomy wound.

[2] It is quite unnecessary here to call attention to the numerous well-known conditions which may simulate appendicitis in infants or the numerous symptoms, characteristic of other diseases, which appendicitis may cause. Certain of the diagnostic features, brought out by the Johns Hopkins cases, may, however, be emphasized.

THE MORTALITY OF INFANTILE APPENDICITIS.

Here again statistics vary greatly, as the following list will show:

Rotter	lost	66⅔%	of	6 cases.
Israel	"	47 %	of	15 "
Broca	"	44 %	of	59 "
Karewski	"	41 %	of	17 "
Lenander	"	25 %	of	4 "
Sonnenburg	"	15 %	of	26 "

The variations in the statistics are largely due, as Karewski has pointed out, to the fact that certain operators have had in their series a preponderance of severe cases. If the statistics of Sonnenburg, for instance, be analyzed with this point in mind, the following results are obtained:

Circumscribed perityphlitis.	Diffuse perityphlitis.
Sonnenburg..Mortality of 0.0%	Mortality of 50%

In general the statistics show that surgeons who operate late report the highest mortality.

The following are the facts as regards the mortality in the Johns Hopkins series:

Total number of cases	9
Recoveries	7
Deaths	2
Mortality	22.22%

An analysis of the mortality, with reference to the pathological condition, follows:

Cases with general peritonitis	2;	deaths, 2;	mortality, 100%
" " circumscribed abscess	4;	" 0;	" 0%
" " spreading peritonitis	1;	" 0;	" 0%
" " early abscess (see under pathology)	1;	" 0;	" 0%
" " unperforated appendix	1;	" 0;	" 0%

The series is, of course, too small to warrant sweeping conclusions. Yet it must be said that in all probability an enlargement of the series would diminish and not increase the mortality; for the series already includes 2 patients (22.22 per cent) with general peritonitis (the only fatal cases)—certainly a fair proportion of cases for which surgery, even in adults, can offer only a moderately good prognosis. On the other hand, the surgeon must expect a larger proportion of such cases among infants than among adults; so that the difficulty of diagnosis will probably always keep up a mortality which, so far as the operation is concerned, is encouragingly low. Taking the statistics as they stand the results are most encouraging. Case 3, a patient with general streptococcus peritonitis and septicæmia, was entirely beyond surgical help quite aside from her age. An adult with a condition similar to that of Case 5 *might* have recovered, though the prognosis would have been decidedly bad. In all the other cases the result of the operation was just as satisfactory as it would have been in adults. Several of the patients made rapid and uneventful recoveries, standing the operation just as well as adults. The striking way in which young infants stand laparotomy for appendicitis has frequently been noted

and it was a feature of our series. Case 8, for instance, a boy of 4 years on his first admission, underwent four abdominal operations (3 times, incision and drainage of an appendix abscess; once, appendectomy and freeing of partial obstruction); yet he stood them all well, made a good recovery and left the hospital well.

It is most encouraging to compare the results in this series with Matterstock's statement in Gerhard's Handbuch (Edition 1880) that the prognosis, in children in the first 5 years of life, is almost absolutely bad. Of 12 children under 6 years reported by Matterstock, 11 died (mortality 91.66 per cent); one 5 year-old child recovered. Between 6 and 10 the prognosis is said to be better; yet at this age there were only 9 recoveries out of 24 cases—a mortality of 62.5 per cent.

Appendectomy in itself is certainly not a serious operation possible operation or where the appendix cannot be found without unduly prolonged search. And such cases are rare. In the case of children, however, certain authors still advise incision of the abscess only; and subsequent appendectomy, *à froid*, when the operation is without mortality. Such a course is recommended by Karewski and has been followed by Broca.

Of the 9 cases in our series, the appendix was removed at the first sitting in 6 (66.66 per cent). In one case (Case 8) it was removed at the fourth operation. In two cases the appendix was not removed; one of these patients (Case 3) died on the table of general septicæmia and peritonitis. The other case developed a fecal fistula after incision of an appendix abscess, but the fistula closed spontaneously. In the seven appendectomies, the appendix was simply ligated with catgut

CHART III.

Case.	Sex.	Age.	Previous attacks.	Family history of appendicitis.	Diagnostic features.	Appendix perforated.	Abscess.	Spreading peritonitis.	General peritonitis.	Appendix removed.	Treatment of stump.	Fecal fistula.	Intestinal obstruction.	Result.	
1	M.	27 mos.	1(?)	0	Diagnosed vesical calculus.	Yes.	Yes.	No.	No.	Yes.	Simple ligation.	No.	Partial about 4th wk.	Recovery.	Diagnosis of vesical calculus on first admission; diagnosis clear on second admission.
2	F.	3½ yrs.	0	0	Diagnosed tubere. arthritis.	P. in cecum.	Yes.	No.	No.	No.	.....	Yes.	No.	Recovery.	Fecal fistula closed spontaneously.
3	F.	4 yrs.	2	0	Peritonitis developed under observation.	No.	No.	No.	Yes.	No.	.....	.....	.....	Death on table.	Condition developed rapidly under observation.
4	M.	3 yrs.	0	0	.....	Yes.	No.	Yes.	No.	Yes.	Ligation and inversion of stump.	No.	0	Recovery.	
5	M.	4 yrs.	0	0	.....	Yes.	No.	No.	Yes.	Yes.	Simple ligation.	No.	11th day.	Death on 11th day.	Pneumonia and pleurisy developed after operation; left-sided abscess found at autopsy.
6	M.	5 yrs.	0	Two uncles.	.....	Yes.	Early.	?	No.	Yes.	Simple ligation.	No.	19th day.	Recovery.	Enterostomy done; ascaris lumbricoides vomited and passed from bowel.
7	M.	5 yrs.	0	0	Signs positive; symptoms confusing.	Yes.	Yes.	No.	No.	Yes.	Simple ligation.	No.	No.	Recovery.	Remarkable associated nervous symptoms.
8	M.	4 yrs.	2	0	.....	Yes.	Yes.	No.	No.	On third admission.	Ligation and inversion of stump.	No.	15th day.	Recovery.	Obstruction associated with vomiting of round worms.
9	M.	5 yrs.	1	0	History typical; abdomen suggestive.	No.	No.	Yes.	No.	Yes.	Ligation and inversion of stump.	No.	No.	Recovery.	A macroscopically normal appendix with free fluid in the pelvis.

in young infants. Adding to the 7 cases of appendicitis in whom appendectomy was done, 2 patients in the first 5 years of life from whom the appendix was removed during the radical cure of a hernia we find that of the 9 cases, 8 recovered (mortality 11.11 per cent) and the only fatality was in a patient with general peritonitis. Or, including all 11 cases in which either the appendix was removed or a laparotomy done for appendicitis we find that 9 cases recovered (mortality 18.18 per cent), the only fatalities being in 2 cases with general peritonitis.

Removal of the Appendix.

The discussion which has waged as to the proper time to remove the appendix in abscess cases may be said to have been pretty generally settled in favor of immediate removal except in cases where the illness of the patient demands the shortest

four times; in the three other cases, the ligated stump was carefully inverted into the cecum with a purse-string suture of fine silk, reinforced by mattress stitches of fine silk. None of the cases developed a fecal fistula.

The surgical problem of infantile appendicitis is then the problem of diagnosis. There is no more reason, indeed there is very much less reason, for operative delay in these cases than in adults. If the patients could be operated on before perforation has taken place a very large majority, if not practically all of them, could be saved. But even after perforation has occurred the prognosis with operation is distinctly good; the danger of obstruction is then the chief disturbing feature. It is absolutely essential to get the cases before peritonitis has become general, *for in these cases the prognosis is almost absolutely bad.* In view of the rapidity with which a general peritonitis may develop and of the increasing seriousness of the

prognosis as a simple appendicitis becomes a spreading peritonitis, an appendix abscess or a general peritonitis, the rule for adult appendicitis holds also for infantile appendicitis: make the diagnosis early and operate as soon as the diagnosis is made.

POST-OPERATIVE COMPLICATIONS.

A right-sided pneumonia and pleurisy developed in Case 5 on the 9th day. Intestinal obstruction, as has been noted, occurred four times; on the 11th, the 15th and the 19th day and in one case, after the patient had left the hospital. The remote possibility that the continuation of symptoms in Case 1 after operation may have been due to iodoform absorption has already been mentioned.

For purposes of reference the chief features of this series have been tabulated (Chart III).

Reference is made in the text to the following articles:

Matterstock: Chapter on Appendicitis in Children in Gerhardt's Handbuch der Kinderkrankheiten. (Edition 1880.)
Karewski: Deutsche med. Wchnschr, 1897. Bd. 23, p. 294.
Selter: Arch. f. Kinderh., 1901, Bd. 31, p. 89.
McCosh: J. Am. M. Ass., Sep. 24, 1904.
Gordon: L'Appendicite chez l'Enfant. Thèse de Paris, 1896.
Manley: J. Am. M. Ass., June, 1901.

THE RELATION OF BOVINE TO HUMAN TUBERCULOSIS.

By W. L. Moss, M. D.,
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Although tuberculosis was known many years before the beginning of the Christian Era, modern work on the subject may be said to have begun in 1865, when Villemin presented his important communication "On the Cause and Nature of Tuberculosis and the Inoculation of the Same from Man to Rabbits." His work was carried out in a methodical and thorough manner. "He inoculated not only with tubercular material from human beings, but also from cases of bovine tuberculosis, and proved experimentally the identity of the latter disease with human tuberculosis."

The above words from Koch (1) are interesting in view of the opinion which he expressed at the British Congress on Tuberculosis in 1901, and in the main so tenaciously clings to to-day.[1]

Notwithstanding Villemin's careful work the partisans of the non-specific theory were not convinced. To the decision of this question Cohnheim and Salomonsen contributed largely by selecting for inoculation the anterior chamber of a rabbit's eye, and they established the fact that tuberculous materials apparently differing widely from each other are characterized by one and the same specific contagium.

Without pausing let us pass to the discovery of the tubercle bacillus by Koch. The field of bacteriology had already proved a fertile one and important discoveries had been made in it since the promulgation of the Germ Theory of Disease by Henle in 1840.

Davaine had discovered the anthrax bacillus in the blood of animals dead of charbon and Pasteur had done his notable work on this disease. Koch says, "In my investigations into the etiology of tuberculosis, I have followed the method by which the parasitic nature of splenic fever was so effectually established."

The history of the discovery of the tubercle bacillus is a familiar story, and much knowledge concerning its morphology, peculiar cultural characteristics, staining reaction, etc., has been obtained but perhaps few realize how much of this knowledge was brought to light by Koch himself a quarter of a century ago. His researches form a truly monumental piece of work and are a model of thoroughness and scientific accuracy.

In reviewing his famous communication (The Etiology of Tuberculosis) with the question of the relation of human and bovine tuberculosis in mind, one is struck by certain conclusions he then reached, especially in the light of his more recent statements on this subject. He states that Villemin did thorough and methodical inoculation experiments, using material from man and cattle, "and proved experimentally the identity of the latter disease with human tuberculosis." As a result of his own experiments he says, "The perfect identity and unity of the tuberculous process in different kinds of animals cannot be doubted."

Cultures from a large number of cases of tuberculosis, human and other, were made with the view of determining if cultural differences might become apparent between bacilli from different sources. Koch writes: "It seemed to me, however, not improbable that though bacilli from various forms of tuberculosis, *perlsucht*, lupus, phthisis, etc., presented no differences microscopically, yet that in cultures, differences might become apparent between bacilli from different sources.

[1] The following quotations are from that memorable address. "Considering all these facts," referring to his recent experiments, he says, "I feel justified in maintaining that human tuberculosis differs from bovine, and cannot be transmitted to cattle." Speaking of the reciprocal relation, he says, "If the bacilli of bovine tuberculosis were able to infect human beings, many cases of tuberculosis caused by the consumption of alimenta containing tubercle bacilli could not but occur among the inhabitants of great cities, especially the children, and most medical men believe that this is actually the case. In reality, however, it is not so." After quoting autopsy statistics regarding the incidence of primary intestinal tuberculosis in children reported by several German observers, Koch concludes this subject by saying, "I should estimate the extent of infection by the milk and flesh of tubercular cattle, and the butter made of their milk, as hardly greater than that of hereditary transmission, and I, therefore, do not deem it advisable to take any measures against it." (Trans. British Congress on Tuberculosis, Vol. I, 1901.)

But, although I devoted the greatest attention to this point, I could find nothing of the kind."

After describing numerous inoculation experiments, he says: "I was not able to demonstrate any differences in the effect of inoculation with material derived from varieties of the tuberculous process, as miliary tuberculosis, phthisis, scrofula, fungous inflammation of joints, lupus, *perlsucht* and other forms of animal tuberculosis."

At the time of his original communication Koch states as his opinion that of the forms of tuberculosis, phthisis and tuberculosis of domestic animals are the important ones as regards spreading infection. Further on he states that, "It is certain that the milk of tuberculous animals may give rise to infection."

The bacillus was first discovered in a preparation stained by strongly alkaline methyline blue. He used acid decolorization, but called attention to other means of decolorizing. He took advantage of counter staining when studying the bacilli in tissues. He showed the value of heat in causing the stain to penetrate, but recommended staining in the cold 12 hours or longer for the best results. He found that the bacillus of leprosy also resisted acid decolorization and predicted that others giving the same staining reaction would be discovered. He announced as a probability that tubercle bacilli are surrounded by a membrane which has a different relation to staining reagents than have the contents, gave his reasons for thinking so, and suggested that the acid-fast quality may depend on this membrane.

The microscopic appearances of tubercle bacilli are described with great accuracy as is also the histological structure of the tubercle.

Koch was thoroughly convinced of the existence of spores in tubercle bacilli and thus explained the infectious nature of the cheesy centers of tubercles in which it is notoriously difficult to demonstrate bacilli.

Regarding the spread of the virus through the body, he refers to the two methods previously demonstrated—one by Ponfick, who discovered the thoracic duct as a channel of infection, and the other by Weigert, who showed that the virus might be disseminated through the veins,—and describes a third mode; namely, by the rupture of a tuberculous focus into an artery.

Mixed or secondary pulmonary infections were noted and the proper significance placed on the presence of the secondary invaders. He made the interesting and significant observation that tubercle bacilli can pass from the blood into the kidney tubules and thence into the urine—an analogue to facts which have since been demonstrated; namely, that tubercle bacilli may be excreted in the milk of a tuberculous cow without lesion of the udder, and that they may pass through the intact epithelium of the intestines without leaving lesions (2), (3), (4), (5).

Koch investigated the virus from a great variety of sources:

(a) Miliary tuberculosis (various organs investigated), 19 cases.

(b) Pulmonary phthisis, 29 cases.

(c) Tuberculosis of various organs:

Tuberculous ulceration of tongue, 2 cases.
Tuberculosis of kidney, 4 cases.
Tuberculosis of bladder and urethra, 1 case.
Tuberculosis of suprarenals, 1 case.
Tuberculosis of uterus and tubes, 1 case.
Tuberculosis of testes, 5 cases.
Solitary tubercle of brain, 2 cases.

(d) Scrofulous glands, 21 cases.

(e) Tuberculosis of joints, 13 cases.

(f) Tuberculosis of bones, 10 cases.

(g) Lupus, 7 cases.

Tuberculosis in Animals.—

17 cases in bovines.
2 cases in equines.
4 cases in swine.
1 case in sheep.
1 case in goat.
2 cases in fowls.
8 cases in monkeys.
17 cases in guinea-pigs and rabbits.

Out of the great number of cases examined he demonstrated tubercle bacilli in all but two.

The next step in the experimental research was to isolate the tubercle bacilli in pure culture. This was successfully done on solidified blood serum, the preparation of which and technique of isolating cultures, he accurately described and there has been little advance made over Koch's original methods.

Now followed a long series of infection experiments with pure cultures in which practically the same results were obtained as with the tuberculous tissues used in his earlier inoculation experiments.

The chain of evidence was complete. The postulates formed by Henle for the proof of the Germ Theory of Disease, the requirements of which were so severe that he (Henle) was never able to attain them, were again expressed and fulfilled by Koch:

1. A specific micro-organism had been demonstrated which was constantly associated with the disease.

2. It had been isolated and studied in pure culture.

3. When reintroduced into healthy animals it had reproduced the disease.

Koch undertook various experiments directed toward discovering a cure for tuberculosis. Animals inoculated with pure cultures were treated with arsenic, carbolic acid, various gaseous germicides, etc., but none of these proved to influence favorably the progress of the disease.

He refers to one experiment and calls attention to its significance. A dog several months old received $\frac{1}{2}$ cc. of pure culture of tubercle bacilli from a case of miliary tuberculosis. The dog seemed ill for a long time, had distinct effusion into the peritoneal cavity and lost flesh; finally it recovered and became strong. Five months later this dog received an injection

of the same culture, but this time 2 cc. were used. For some weeks there were no symptoms of illness, then loss of flesh and ascites appeared. The animal either died or was killed after 5 weeks and extensive tuberculosis was found. The omentum, peritoneum, liver, spleen and lungs showed an extraordinary number of tubercles.

Koch says: "This experiment is of particular interest in that one dog after an injection of ½ cc. of bacillary fluid became decidedly ill, but recovered. This is the only case of tuberculosis in animals where I saw recovery take place. The hope has often been expressed that a preventive inoculation with attenuated virus will be accomplished against tuberculosis as against splenic fever. But if one successful battle with tuberculosis affords protection from a second attack of the disease, which view, by the way, is not borne out by clinical experience, this dog should have been immune against further infection. But, this was not the case, and the circumstance has a bearing against the fulfillment of the hopes referred to."

Up to the time of Koch's work there was much circumstantial evidence pointing to animal tuberculosis as a source of danger for man and the discovery of the tubercle bacillus in both human and animal tuberculosis and of the pathogenicity of the bacillus isolated from human tuberculosis for animals, gave a distinct scientific basis for the belief in this danger.

It may be of interest to see how strong a case can be made out against tuberculous cattle, both before Koch's discovery and following it by a period of about 16 years; that is until 1898 when Theobald Smith (6) differentiated the two types of tubercle bacilli.

That bovine animals may be infected with the tuberculous material from human beings, though sometimes with difficulty, has been abundantly shown both before and since Koch's London address. Chauveau (7) was perhaps the first and a long list of names has been added to his, of experimenters who have succeeded in infecting bovine animals with human tuberculous material.

The only case of direct intentional inoculation of man with the virus of bovine tuberculosis, so far as I have been able to find, is cited by Bovaird (8), who says that "Kohler has, however, recalled the fact that as long as 20 years ago Rokitansky, influenced by the supposed antagonism between tuberculosis and cancer, inoculated a number of incurable cancer patients with bovine tuberculosis. Most of these patients lived many months or a year after the inoculation. Some of them developed small, local, quickly-healing ulcers, but at autopsy none of them showed tuberculosis."

There are on record, however, a number of cases in man where the circumstantial evidence points strongly to infection of bovine origin. These may be divided into two groups.

GROUP I. CUTANEOUS INFECTIONS.

CASE 1.—Tscherning (9) reports the case of a veterinarian who, while performing an autopsy on a tuberculous cow cut his thumb slightly with a scalpel. The wound healed, but three weeks later the neighboring parts became swollen and movement of the thumb painful, suppuration ensued and at this time it was thought not to be of a tuberculous nature. The condition grew worse, however, and at the end of 2½ months the lesion was extirpated and on microscopic examination proved tuberculous, by the demonstration of tubercle bacilli in the tissues.

Tscherning reports also a case in which a servant cut his thumb with a broken glass cuspidor which had been used by his tuberculous master. After several months it was necessary to amputate the thumb and remove the glands at the elbow and axilla.

Histological examination of the tissue and demonstration of the bacilli proved this case tuberculous.

The author contrasts these two cases and points out that the inoculation of virus from human source was accompanied by more serious results than in the case where the virus was of bovine origin.

CASE 2.—L. Pfeiffer (10), reports the case of a veterinarian, "M," 34 years old, of a healthy family. In the summer of 1885, while performing an autopsy on a tuberculous cow, he suffered an injury to the left thumb, the knife probably entering the joint. The wound healed *per primam*. In the course of 6 months there developed a skin tubercle in the cicatrix, and the joint became stiff. In the fall of 1886 an attack of pharyngitis was followed by hoarseness, cough, expectoration. Tubercle bacilli were found in the sputum. In January, 1887, examination of the lungs showed infiltration of the right lower posteriorly. Sweats and diarrhœa with death ensued 1½ years after the injury.

The axillary glands were not involved. On opening the joint which was the original seat of the injury, the cartilage was found necrotic, the cavity filled with dry exudate which, on microscopic examination, was found to contain large numbers of tubercle bacilli.

CASE 3.—Smith (11) quotes case reported by Coppez. A girl 17 years old had a wound on the palmar aspect of the third finger between the second and third phalanx which became infected with tubercle bacilli while milking. The original lesions gave rise, within 6 months, to over 35 subcutaneous abscesses situated in different parts of the body. Subsequently more appeared, in all 60-66. At no time could any visceral lesions be recognized, but one eye became involved. The nature of the affection was demonstrated by inserting some pus from an abscess into the eye of a rabbit.

CASES 4, 5, 6 and 7.—Ravenel (12) reports 4 cases of cutaneous tuberculosis which he has observed, all occurring in veterinarians who received skin wounds, three of them while performing autopsies on tuberculous cows, one while performing an autopsy on a goat which had been infected with bovine tubercle bacilli. All of these 4 cases developed skin lesions which were subsequently excised and their tuberculous nature proved by histological examination of the tissue, inoculation or demonstration of the tubercle bacilli in sections.

CASE 8.—M. B. Hartzell (13) reports a case occurring in a man who received a slight injury on the hand while cleaning cattle cars. The trifling wound at first healed promptly but later became slightly painful, swollen and finally developed into a form of lesion known as tuberculosis cutis verrucosa. The patient at this time was in excellent general health, weighing about 175 lbs., and so far as could be learned, had never been seriously ill. Under appropriate treatment the primary lesion healed permanently, but a year later an examination of the patient showed emaciation, persistent and frequent cough, expectoration, elevation of temperature, and decided dullness at the apex with numerous râles.

CASE 9.—Ravenel (5) quotes the following case by Troge which is regarded as especially convincing: A young butcher in good health, and with no hereditary taint, wounded his right forearm slightly while working on a tuberculous cow. The wound healed under treatment, but 6 weeks later showed signs of inflammation, and a tubercle formed on the internal face of the elbow. There

were two small fistulæ on the forearm, and enlargement of the ulnar and axillary lymph glands. A month later the middle forearm was covered with granulations, which steadily increased in area, and in spite of treatment, at the end of two months assumed the character of lupus. Histological examination at this time proved the tuberculous character of the disease. Two years after the injury Troge found an abscess which extended deep into the muscular layers. The pus contained tubercle bacilli, and the tissues showed typical tuberculous lesions. Some months after the glands of the left axilla and subclavicular space were extirpated, and proved to be tuberculous. All possibility of infection from human sources was excluded by Troge.

Case 10.—Ravenel (12) states that the death of Mr. Thomas Wally, Principal of the Royal Veterinary College of Edinburgh, is also attributed to infection gaining entrance through a wound received while making an autopsy on a tuberculous cow.

Cases 11, 12, 13, 14, 15 and 16 are all cited by Ravenel (12).—"Dr. Kurt Mueller, a surgeon of Erfort, describes the cases of two healthy young men who were under his care. Both were butchers, and in both cuts were sustained while working on tuberculous cattle, the wound opening the synovial sheath of a tendon in the hand. In each case an operation was necessary, and it was found that the wall of the sheath, as well as the tendon itself, was thickened, while upon them were large numbers of yellow nodules, proven to be tubercles by miscroscopic examination. These tubercles were placed very thickly near the scar, gradually becoming fewer as the scar was left. In one of the men the trouble extended from the finger to the forearm, and there was some evidence of tuberculosis even at the muscular attachment of the tendon. In the second case the tendon was attached to the sheath, and the disease limited to an area 10 cm. in length. Examination of the removed tissue proved the presence of tubercle bacilli. Both of these men had good family histories, and were free from tuberculosis elsewhere, so that Dr. Mueller has no doubt that they were inoculated with bovine tubercle bacilli."

Case 13.—"De Jong observed the case of a man who injured his finger while examining the mesentery of a tuberculous cow. The wound did not heal, the edges became indurated, and considerable swelling ensued, with pain which increased steadily and failed to yield to ordinary treatment. Curettage and cautery were finally used with success. In the scrapings tubercle bacilli were demonstrated."

Cases 14, 15 and 16.—"Drs. Joseph and Trautmann report three cases of verrucose tuberculosis of the skin occurring among employes of the municipal abattoir in Berlin, who worked exclusively with tuberculous animals."

"J. G., aged forty-five years. Was never ill before, and no tuberculosis in his family. His duties were to cut up tubercular and condemned carcasses. In 1892 or 1893 he received a small wound of the middle finger of the left hand, and a nodule soon formed, surrounded by a zone of redness. It increased slowly until 1897 or 1898 when the thermocautery was resorted to with partial success. About a year ago the man tore the first finger of the same hand on a bone from a tubercular cow. The wound cicatrized in about eight days, but later a nodule developed on the site. When examined, in August, 1891, the disease was confined to the first and middle fingers of the left hand. On the first finger nodules about the size of a pea protruded from the surface 1 mm. to 2 mm., moderately red, and having in the center a broken area covered with small crusts. The nodule on the middle finger was much larger and the verrucose condition more developed."

"J. O., aged thirty-five years. No history of tuberculosis in family. The patient, his wife, and three children had always been healthy. Has been employed in the abattoir for one year, and always in division reserved for tuberculous animals. Three months before he had suffered a wound of two fingers, following which the disease developed. On the little finger is a hard, rough, thickened area, extending entirely through the skin. On one side is an ulcer which goes deep into the corium."

"K. S., aged thirty-eight years. Employed in handling tubercular material. He showed a typical tuberculosis of the skin. As the case was being treated by another physician, the details are not given."

Group II. Alimentary Infection.

Cases 1, 2 and 3.—Ernst (4) quotes a very interesting case, which as he points out, illustrates that the danger from the consumption of milk from tuberculous cows was appreciated by individuals at least before the announcement of Koch's discovery.

The extracts are from a letter written by a veterinarian of Providence, R. I., and are so interesting that they are given in full.

"Mr. W., June 15, 1878, called me to see a white and red cow which coughs and is short of breath and wheezes. Pulse 60; respiration 14, and heavy at the flanks; temperature 104°. Diminished resonance of right lung, but increased in part of the same. Emphysematous crackling over left lung and dulness on percussion. Diagnosed a case of tuberculosis and advised the destruction of the animal."

"December 12.—Cow in a cold rain a few days ago for about two hours. Milk still more diminished than at a visit made on September 25. Again advised the destruction of the cow. Family still using the milk. Respiration 20; pulse 85; temperature 104.6°."

"February 22, 1879.—Temperature 104.8°; respiration 26; pulse 68. Losing flesh fast. Milk still in small quantities. Advised, as before, to destroy the animal and not to use milk."

"May 30.—Called in a hurry to see cow. Is now as poor as could be. No milk for a week. Pulse 80; respiration 40; temperature 106°. The cow died in about three hours. Autopsy made fourteen hours after death: Lungs infiltrated with tuberculous deposit. Weight of thoracic viscera 43.5 lbs. Tuberculous deposits found in the mediastinum, in the muscular tissues, and in the mesentery, spleen, kidneys, udder, intestines, pleura, and one deposit on the tongue. The inside of the trachea was covered with small tubercles."

"In August, 1879, the baby was taken sick, and died in about seven weeks. On post-mortem of the child there was found meningeal tuberculosis—deposits all over the coverings of the brain and some in the lung."

"In 1881 a child, about three years old died with, as it was called, tuberculous bronchitis. And in 1886, a boy, nine years old, who for three or four years had been delicate, died with consumption,—'quick,' as it was called."

"So far as known, the family on both sides have never before had any trouble of the kind, and the parents were both rugged and healthy people, and so were the grandparents—one now being alive and sixty-eight years old, and the other died at seventy-eight."

Cases 4, 5, 6, 7 and 8.—Adami (3) cites the following cases: He writes: "Demme records a case of four infants in the Children's Hospital at Berne, issue of sound parents, without any tuberculous ancestor, who died of intestinal and mesenteric tuberculosis as the result of feeding on the unsterilized milk of tuberculous cows. These were the cases in which he was able to exclude the possibility of other causes for the disease and decided that the milk alone was to blame."

The Cattle Commissioners of Massachusetts give reference to a case of an infant, son of a college mate of one of their body, a comparatively strong healthy child of twenty-one months, who, visiting a relation for a week, drank unsterilized milk of a cow which was soon after condemned and killed in a state of generalized tuberculosis; this child died three months later with

mesenteric tuberculosis. Only distant relations had died of this disease and the child had seen but one of these and that for short intervals. A second child of the same family brought up on sterilized milk remained in robust health; the parents were free from the disease. Even in a case like this, convincing as it seems, more information is required with regard to the nurse and servants of the household, the possible existence of any case of tuberculosis in the house of the relation visited and so on."

CASES 9, 10, 11, 12, 13, 14, 15, and 16.—Eber (14) cites the following cases: Baum collected the cases of tuberculosis of man contracted through animals in 1891. Among these cases the most interesting ones are the following:

A 14 years old girl of healthy parents, in her youth perfectly well, died of tuberculosis of the larynx which had spread to the ileum and cecum and to a slight extent to the lungs. It appeared that the girl had drunk plentifully of warm cow's milk which was obtained from a cow which had extensive tuberculosis (Hermsdorf).

A child of healthy parents which had thrived during the time it was nourished by its mother, soon became ill after being weaned and died of acute tuberculosis of the brain. The milk which the child drank came from tuberculous cows. After taking the same milk, another child from different parents died likewise of acute tuberculosis of the brain (Leonhardt).

At the autopsy of a 6-months old child whose parents were perfectly healthy, brain tuberculosis was found. The child had as nourishment only taken the milk of a tuberculous cow (Sonntag).

A boy of four or five years had taken milk, warm from a cow, which later on autopsy proved to be definitely tuberculous. This boy became sick and died of tuberculosis of the mesentery and tuberculous lymphadenitis and pulmonary tuberculosis (Stang).

Johne reports a case. He obtained the breast and abdominal viscera of a highly tuberculous cow with a note that this animal had up to a few weeks previously been the most beautiful and best nourished animal in the stables, then became very much emaciated. On account of its very healthy condition previous to its illness the owner had used the milk to nourish his newly born child. Johne felt it his duty to report to a colleague, who stated to the father of the boy that the cow had extensive tuberculosis, and that he should look after the health of the child; the colleague learned later that the child following an attack of measles had catarrhal inflammation of the lungs and that it was apparently falling off in its nutrition. A short while after Johne was informed that the child 2½ years old had died of miliary tuberculosis of the brain. The other children of the family had remained perfectly healthy (Johne).

A case very similar to this is reported by Prümers in a brewer's family at Koblenz. Two children were nourished with the raw milk of a cow which was considered perfectly healthy and which had been fed with particular care. The children died of tuberculosis before they had attained their third year. The parents as well as the grand-parents of the children were healthy. The cow showed after being killed an extensive tuberculosis (Prümers).

CASES 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, and 30.—Ravenel (12) cites the following cases: "One of these cases reported by Gosse, of Geneva, is so strong that Nocard has well said, 'It has almost the value of an experiment.' Gosse was a physician himself and the son of a physician. His own daughter was infected by drinking the milk of a cow with tuberculosis of the udder on his own farm, and he had the remarkable courage to perform a post-mortem examination and give the results to the scientific world."

"Bang, through inquiries in Denmark, has collected reports of nine persons in whom infection could be traced with reasonable certainty to milk from tuberculous cows."

"Von Ruck reports the cases of a father and child which are very convincing and says that he has observed several others in which there was very good reason to believe that milk was the agent of transmission for the tubercle bacillus."

"Klebs and Rievel have recently reported two cases which came under the observation of the former. A healthy young man, employed by Klebs to assist in making some investigations on milk infection had the habit of drinking the milk of the tuberculous cows used in the experiment. In a few months he died of miliary tuberculosis. The second case was one of six male children, who died at the age of two years of tuberculosis of the cord and meninges. This child was the only one of the six fed on cow's milk and the only one that developed tuberculosis."

CASES 31 and 40, inclusive. Bovaird (15) quotes among others the following cases:

"Law relates the case of a strong vigorous boy of 1½ years who for a week drank the milk of a cow which was shortly after condemned and killed in a state of generalized tuberculosis. In 6 weeks the child was noticeably falling off and in 3 months died, a mere skeleton, with tuberculosis of the abdomen. The father could trace no tuberculosis in his near ancestors, but the mother's father and uncle had died of it. She herself was in perfect health."

"Ollivier reports 13 cases of tuberculosis, 4 of them primary in intestine, in a school supplied with milk from a tuberculous cow. Brouardel reported that in a boarding school in which there were 14 girls, 5 contracted tuberculosis from drinking the milk of a tuberculous cow."

Sladen (16) quotes Woodhead as the authority for the statement that in a dairy in Scotland, 3 cows were found to have tuberculosis of the udder. In the institution to which this milk was supplied the mortality from tuberculosis during the last year was 30 per cent, and during the preceding year, 40 per cent of the total mortality.

In many of the cases in Group I where the infection occurred in veterinarians, while performing autopsies on tuberculous cattle, the evidence that the primary lesion was due to inoculation with bovine tubercle bacilli may be accepted as conclusive. That pulmonary or other forms of tuberculosis developing subsequently, were consequent upon the bovine infection cannot be affirmed with the same certainty in the case of a disease so prevalent and to which exposure from various sources is so common. While the cases of Group II scarcely furnish so convincing evidence as do those of Group I, they are of much more importance since a comparatively small number of people are exposed to risks of skin inoculation while an enormous number of individuals are exposed to whatever dangers lie in drinking tuberculous milk.

This can be appreciated when one considers that in England 30 per cent of all the milk cows, according to McFadyean (17) are estimated to be tuberculous. The figures for this country are not so accurately known but perhaps, 10-15 per cent represents the number. A. D. Melvin, Chief of the U. S. Bureau of Animal Industry (Internat. Congress on Tuberculosis, Washington, 1908), states that reports of tuberculin tests made in the 15 years from 1893 to 1908 by federal, state and other officers with tuberculin prepared by the Bureau of Animal Industry have been carefully analyzed and tabulated. Out of 400,000 cattle tested (mostly dairy cattle) there were 37,000 reactions or 9.25 per cent.

As to the reliability of the test he states that out of 23,869 reacting cattle slaughtered, lesions of tuberculosis were found in 23,583, a percentage of 98.81. That all of these are excreting tubercle bacilli in their milk cannot be taken for granted. Those with tuberculous lesions of the udder are to be regarded as most dangerous, although the others are a possible source of danger since it has been shown that tubercle bacilli may be present in the milk of tuberculous cows even though they have no discoverable lesion of the udder. Numerous investigations have been undertaken to determine the frequency of occurrence of tubercle bacilli in market milk. Hess (Internat. Congress on Tuberculosis, Washington, 1908) reports the results of tests carried out on milk in New York City. One hundred and seven specimens were tested by inoculation into guinea-pigs and 17 specimens (16 per cent) contained tubercle bacilli.

I have been able to find no well authenticated case in man of infection from cattle, through the respiratory route. Although, the possibility of this has been suggested, its demonstration necessarily will remain difficult.

The attempt has been made to throw light on the relationship of bovine to human tuberculosis by pathological studies.

The fact that intestinal and mesenteric gland tuberculosis occur most frequently in children at the age when milk forms the most important article of diet, considered with the further fact of the widespread existence of tuberculosis among dairy cattle is a significant coincidence.

If it can be proven that the lesions are primary in the intestine in a considerable percentage of cases, the coincidence becomes more significant.

That this is not an essential link in the chain of evidence, however, is shown by Ravenel (5) and others who have proven that tubercle bacilli may pass through the intestinal wall without producing any demonstrable lesion. Thus the primary lesion may be tuberculosis of the mesenteric lymph nodes, or even in more remote parts of the body. Theobald Smith (11) says: "With the two facts before us that tubercle bacilli gravitate, as it were, towards the lungs in all the susceptible mammals, and that they may conceal their movements in the body quite effectually, we must regard infection through the digestive tract, as a source of phthisis at least deserving attention."

Nor is it enough to consider the intestine alone as furnishing a portal of entry for ingested tubercle bacilli. Ravenel (18) and others have demonstrated that infection may (perhaps frequently does) take place through the tonsils.

On the other hand, even when the primary lesion can be demonstrated in the intestine and even though it be the only focus of infection in the body, it does not by any means prove infection of bovine origin. There are abundant opportunities for tubercle bacilli from human sources to get into the intestinal canal. The contamination of food with dust, or by flies which have fed on phthisical sputum; the introduction of the bacilli in the mouth, by soiled hands, especially in children; and numerous other ways which readily suggest themselves are common.

Autopsy Statistics.

Koch in his London address states that, in the many cases of tuberculosis examined after death, he remembers having seen primary tuberculosis of the intestine only twice. He says that among the great post-mortem material of the Charité Hospital, in Berlin, 10 cases of primary tuberculosis of the intestine occurred in 5 years. He quotes Baginsky as never having found tuberculosis of the intestine without simultaneous disease of the lungs, and bronchial lymph glands, among 933 cases of tuberculosis in children at the Emperor and Empress Frederick Hospital for Children in Berlin.

Biedert observed only 16 cases of primary tuberculosis of intestine among 3104 post-mortem examinations of tuberculous children.

In striking contrast to these are the reports of Still (19), who in 269 consecutive cases of tuberculosis among children under 12 years of age, at the Great Ormond St. Hospital for Sick Children in London, found 53 cases of primary intestinal origin and 10 cases of probable primary intestinal origin, forming when taken together, 23.4 per cent of the total number of cases of tuberculosis in children.

Dr. Shennan (cited by McFadyean (17)) finds from the autopsy records of the Royal Hospital for Sick Children in Edinburgh, that 28.1 per cent of the cases of tuberculosis among children are af primary intestinal origin.

The conclusions drawn by Sir Richard Thorn (20) (The Harbin Lectures, 1898), reviewing the statistics for England during the last 50 years are most interesting. He points out that the mortality from tuberculosis in all its forms, including phthisis, had fallen at the rate of 45 per cent to 60 per cent at different ages, whereas in the case of infants under 1 year of age, not only did this gain disappear in so far as tabes mesenterica was concerned, but that there was an increase in the mortality from this disease of 27.1 per cent.

It is his belief that the great decrease in the general death rate from tuberculosis in England during the past 50 years is attributable to the improved sanitary conditions which have obtained, but the increased mortality from tabes mesenterica in children under 1 year of age, he ascribes to the steady increase in the use of cow's milk in a country where it is estimated that 30 per cent of all dairy cattle are tuberculous.

McFadyean (17) points out several weak points in this argument. He says: "Perhaps the weakest of all is the assumption that the deaths certified under the head of tabes mesenterica correspond closely with those which the pathologist would classify as cases of primary alimentary infection.

"It is scarcely possible to doubt that the term tabes mesenterica in the Registrar-General's return covers a heterogenous collection of cases of which the majority may not be cases of tuberculosis at all, but even if it is agreed to accept all of the cases registered under the head of tabes mesenterica as instances of primary alimentary infection, the figures found in the Registrar-General's returns do not support the contention that milk is responsible for all of the cases of tabes. It is true that they indicate an increase in the death rate from alimen-

tary tuberculosis among children under 12 months old but on the other hand there appears to have been a considerable decline in the death rate from the same cause at all ages between 1 and 5 years.

"Now, if tuberculous milk were a frequent cause of tuberculosis, one would not have expected the death rate from that cause to decline among children between 1 and 5 years of age, for there is no reason to suppose that there has been any decline in the use of cows' milk in the feeding of children at that age during the last 50 years. The fact appears to be that the Registrar-General's returns do not afford much trustworthy information with regard to the number of cases of primary alimentary tuberculosis, and are absolutely worthless as an indication of the extent to which human beings are infected by means of milk."

A glance at the above statistics shows that there is a great lack of unanimity in the results obtained. It seems likely that this disagreement is due largely to a difference in interpretation of the results of autopsy findings. One seems justified in concluding from them, however, that among children dying of tuberculosis, a not inconsiderable proportion of them have gotten the primary infection through the alimentary tract, and when one considers the frequency with which tubercle bacilli are found in cows' milk and the important element milk is in the diet of children, they point rather strongly to tuberculous milk as an important etiological factor in human tuberculosis.

On the other hand there are certain reports which perhaps detract somewhat from the value of these statistics.

Kitisato (21) states that in Japan it is a fact of common knowledge that the native cattle are free from tuberculosis under ordinary conditions. The mortality statistics show that during the two years, 1899-1900, 1,842,831 people died. Of these 139,380 died as result of tuberculosis, or 7.56 per cent of the total mortality. He quotes from Tamaye Ogiya, working under the directorship of Prof. Sata from the Pathological Institute at Osaka. This authoress states that during a period of 3½ years she has found among 250 autopsies, 116 cases of tuberculosis, amounting to 46.4 per cent of the total. Of the tuberculous patients 20 (17.3 per cent) were under 18 years, 96 (82.2 per cent) were more than 18 years. Among these patients she found 90 (77.6 per cent) showing primary pulmonary tuberculosis, 12 (10.34 per cent) who had primary intestinal tuberculosis. Among the latter 6 were more than and 6 less than 18 years.

Basing the statement upon this paper it may be said that the occurrence of primary intestinal tuberculosis is not rare in Japan, either among adults or children, although cows' milk is employed but little in this country for the nourishment of children. To show to what a small extent milk is used in Japan, Kitisato makes the following interesting calculation. He states that one cow in Japan furnishes in the course of a year a daily average of 5 liters of milk. Calculating the total production of milk in Japan and dividing this by the population he finds the per capita allowance of milk in all Japan is 3.825 cubic centimeters.

Baldwin (22) says, "The same conditions concerning the use of milk are alleged to exist in Greenland (Djier), the Gold Coast (Fisch), China, the Philippines, Turkey, Sicily and Sardinia. Yet, in all these countries tuberculosis is prevalent in all forms and to the same extent as in Europe and America."

The principles of immunity have been resorted to, in various attempts to solve the problem of the relationship between human and bovine tuberculosis. For example, the subcutaneous inoculation of cases of tuberculosis in man with tuberculin made from the human type of bacillus and with tuberculin made from the bovine type of bacillus. No constant characteristic difference could be made out in the reactions obtained however, which would throw any light on the type of bacillus present in a given case.

More recently Detre (23) claims to be able to determine in cases of tuberculosis which variety of bacillus is present by inoculating, according to the cutaneous method of v. Pirquet, simultaneously with human and bovine tuberculin. He thinks that the tuberculin giving the more marked reaction corresponds with the variety of bacillus present.

The large proportion of phthisical cases in which Detre found the reactions practically equal (19 per cent) and ascribed to a double infection (human and bovine) seems to cast much doubt on the value of the test. The work is too recent to have received the necessary confirmation, and others, working independently along the same lines, before Detre's publication, obtained results which are not fully in accord with those of Detre.

Some light may come from therapeutic uses of the two kinds of tuberculin. Nathan Raw (24), going on the assumption that certain forms of tuberculosis are caused by infection with the bovine type of bacillus, and that other forms are due to the human type of bacillus; and the further assumption that an infection with one type gives a greater or less degree of immunity against infection with the other type, uses tuberculin made from the bovine bacillus in the treatment of those cases in which he thinks the infection is due to the human bacillus, and he uses tuberculin made from the human type of bacillus in the treatment of cases which he supposes to be of bovine origin.

The evidence coming from the therapeutic test will necessarily be slow in accumulating and time must develop what light this procedure will throw on the question.

Agglutination Reaction.—Arloing and Courmont (25) have investigated the agglutination reaction of the sera of tuberculous patients with reference to the two types of bacilli. While differences were noted they were not sufficiently constant to apply to the determination of the type of infection present. Furthermore, differences in the agglutination reaction of a given serum for two or more strains of the human type of bacillus were sometimes greater than existed for two strains, one human and the other bovine.

None of these methods of approaching the question, however, have been entirely satisfactory; they throw light on the

subject and are valuable as circumstantial evidence, but they lack the exactness of scientific laboratory experiments.

A new method of approaching this all-important problem was furnished, by the differentiation of tubercle bacilli into two types, the *typus humanus* and *typus bovinus*. The recognition of these two types is due to the work of Theobald Smith (6), whose important communication was made in 1898. The distinction which he made has since been recognized by the British Commission, the German Commission, the workers in the Bureau of Animal Industry in Washington and many other men of the highest authority.

It is not necessary here to go into the details of this differentiation. The distinction is made on differences of pathogenicity, morphology, staining reaction, cultural and biological characteristics. It seems strange that Koch did not recognize these differences at the time of his original publication, in 1882, as he worked with cultures from a great variety of sources both human and bovine, and states that he studied them with this point especially in view, but was unable to recognize any differences.

Difference in virulence was, however, noted at an early time. The difficulty of producing tuberculosis in cattle with material from cases of human tuberculosis was reported by numerous investigators, some even denying the possibility of doing so, among whom Koch in his London address (1901) took the most radical stand, affirming that the disease in human beings and bovines was totally different and denying almost utterly the communicability either from man to bovines or from bovines to man. This radical departure called forth a storm of opposition from the other members of the congress. It was admitted that difference in virulence did exist between human and bovine tuberculous materials and in pure cultures isolated therefrom, but the consensus of opinion at that time seemed to be that this difference was perhaps due to the influence exerted on the bacillus by residence in a particular host or repeated passage through certain animals.

Lister (26) pointed out the change in virulence for cattle which the virus of small-pox underwent in the human host and thought it might be analogous to what took place in tubercle bacilli residing in man.

Subsequent work, however, has not upheld this view. The German Commission taking the most radical stand, maintains that the characteristics of the two varieties (human and bovine) are firmly fixed and that mutations never occur.

The British Commission, Theobald Smith, Ravenel and others, while agreeing that the characteristics are quite firmly fixed in the two types, are not so positive that changes in virulence never occur. They have all observed cultures, usually of human origin, which at first showed the characteristics of the less virulent, more eugenic type, undergo an increase in virulence on repeated passage through animals.

Several possible explanations of these variations have been advanced.

1. That the original cultures contained both types of bacilli but that the characteristics were determined by the preponderance of the less virulent, but more luxuriant, human tubercle bacilli. On passage through animals resistant to the human bacilli, however, the bovine type was largely or solely the one which survived.

2. The second possibility is that mutation occurred and an organism originally of low virulence was influenced in some way by residence in an unusual soil so as to heighten its virulence. Theoretically this is perhaps a not altogether unreasonable explanation.

It seems highly probable that the two types have descended from a common ancestor and that they have been differentiated from each other by long continued differences in environment. It is even conceivable that this process is still going on to some extent, and if so, organisms which had certain characteristics impressed on them comparatively recently, might with relative ease lose such recently-acquired characteristics.

These cases must be regarded as rare, however. The British Commission having recorded but 5 cases in which the characteristics seemed unstable. Ravenel, Theobald Smith and a few others record instances, while the majority of cultures adequately studied have possessed characteristics which remained remarkably constant.

Koch calls attention to the constancy of the cultures studied by him even after more than a year of artificial cultivation.

The British Commission think it possible that in rare instances cultures undergo slight variations but on the whole that they are stable. Theobald Smith, Ravenel and others think that the characteristics are sufficiently constant to mark two distinct types.

The German Commission, as stated above, hold that mutation does not occur. Their position in the matter is interesting. That in a certain proportion of cases among humans, bacilli of the bovine type are found, they admit; holding however, that these are responsible only for the milder forms of intestinal and mesenteric node tuberculosis and do not produce the fatal forms such as generalized or pulmonary tuberculosis.

In cases of extensive tuberculosis in which the bovine tubercle bacilli are isolated they maintain that the severe lesions are produced by human tubercle bacilli, while the bovine tubercle bacilli remain localized in the intestine or neighboring lymphatics.

Let us now turn to the cases recorded in which the type of bacillus present has been determined by exact bacteriological methods.

The British Commission (27) has studied the nature of the tuberculous material obtained from 60 cases of the disease in man. These they separate into three groups as follows: Group I consisted of 14 cases in which bacilli of the bovine type were found, made up as follows: The bacilli in one case were isolated from the sputum; in 3 cases from tuberculous cervical glands removed by operation, and in 10 cases from mesenteric glands of cases of primary abdominal tuberculosis. All of the cases of abdominal tuberculosis occurred in children and showed some distinctive feature demonstrating the primary origin of the disease.

Group II consisted of 40 cases in which bacilli of the human type were found. The cases forming this group consisted of various forms of tuberculosis, including cervical lymph glands removed at operation, 8 cases of mesenteric glands removed after death from cases in which the disease seemed to be of alimentary origin. In 10 instances the material consisted of lungs or bronchial glands from cases in which the disease was of respiratory origin, namely pulmonary tuberculosis. One case was that of a tuberculous kidney and one case of tuberculous testes. Nine were cases of tuberculous affections of the bones or joints.

Group III consisted of 5 cases which yielded bacilli occupying a position intermediate between the human and bovine type. This group does not form a group in the sense in which the cases of Group I, and Group II form a group.

In Group I and Group II the cases in each group differ so little from each other as to form an almost homogeneous group. In Group III the cases differ widely from each other, and are grouped together for consideration on account of their exceptional features. Were it not for these exceptional features some might be placed in Group I, others in Group II. The following is a brief abstract of the report on these five exceptional cases.

Case H. 53 "D. H." Lupus. The tubercle bacilli showed intermediate virulence.

Case H. 49 "T. C." Primary abdominal tuberculosis. The original culture exhibited a virulence slightly below that of bovine bacilli, but the second culture (after passage through calf) showed full virulence. After repeated subculturing on serum it lost its virulence for cattle.

Three other cases are placed in Group III because on repeated passage through calves they assumed the virulence of bovine tubercle bacilli although when originally isolated they had all the characteristics of the human type.

The German Commission (28) has studied cultures from 84 cases of tuberculosis in children; in 63 of which it found tubercle bacilli of the human type and in 21 bacilli of the bovine type.

Their results are tabulated in convenient form below:

Origin of material investigated.	Form of tuberculosis present.	No. cases investigated.	Type of bacilli found.	
			Typus humanus	Typus bovinus
Autopsy material	Pulmonary tuberculosis (phthisis, caseous pneumonia, caseous bronchitis); general miliary tuberculosis; tuberculous meningitis	18	18	..
	Primary intestinal and mesenteric gland tuberculosis	20	7	13
	Case of general miliary tuberculosis in which the portal of entry could not be determined	1	..	1
Material removed at operation	Cervical gland tuberculosis	16	10	6
	Tuberculosis of bones and joints	27	26	1
	Tuberculosis of axillary glands	1	1	..
	Skin tuberculosis (Lupus)	1	1	..
		84	63	21

To the above list of cases two cases of double infection (human and bovine) must be added.

(1) H. 38. Caseous and calcified mesenteric glands. Circumscribed fibrous peritonitis. Conglomerate tubercles of the spleen. Miliary tubercles of the splenic capsule and of the left pleura.

(2) H. 74. Intestinal ulceration. Caseous mesenteric glands. Tuberculous meningitis.

From the mediastinal glands bacilli of the bovine type were recovered. From the meninges and from the microscopically unaltered bronchial glands, bacilli of the human type were recovered.

In a series of 54 cases of tuberculosis in adults, bacilli of the human type were found in every case. In one of the 54 cases bacilli of both the human and bovine type were present. These cases are tabulated below:

Form of tuberculosis.	No. of cases investigated.	Type of bacilli found.		
		Human.	Bovine.	Avian.
Pulmonary tuberculosis	32	32	..	
General miliary tuberculosis	2	2	..	
Primary intestinal and mesenteric gland tuberculosis	6	6	1	
Tuberculosis of the peritoneum	3	3	..	
Tuberculosis of the retroperitoneal glands	1	1	..	
Tuberculosis of the bronchial and mesenteric glands	1	1	..	
Tuberculosis of the pericardium, pleura and peritoneum	1	1	..	
Tuberculosis of the cervical glands (operation material)	2	2	..	
Tuberculosis of the bones and joints (9 operation material)	11	11	..	
Urogenital tuberculosis	2	2	..	
Ileocecal tumor (operation material)	1	1	..	
Tuberculosis of the mucous membrane of the mouth	1	1	..	
Skin tuberculosis (tuberculosis cutis verrucosa)	1	1	..	
	54	54	1	
Tuberculosis in Animals.				
Bovine	13	..	13	..
Swine	8	..	7	1
Sheep	1	..	1	..
Hens	12	..	..	12
Pigeons	1	..	..	1
Pheasants	1	..	..	1
Parrots	2	2	..	..
	38	2	21	15

In addition to these cases studied by the British and German Commissions there are reports in the literature of smaller series of cases, in which, however, the type of bacillus present has been satisfactorily worked out.

Lewis at the International Congress on Tuberculosis, held in Washington (1908), reported a series of 15 cases of cervical gland tuberculosis in which he had worked out the bacteriology. The cultures were obtained from the glands removed at operation. Of the 15 cases studied, 9 yielded cultures of the bovine type and 6 of the human type.

Duval, of Montreal (International Congress on Tuberculosis in Washington, 1908), reported studies on the bacilli recovered from four cases of cervical adenitis. In one he found the bovine type of bacillus present, in one the human type. The bacilli present in the other two cases he regards as intermediate in type.

History of culture "BB" obtained from mesenteric glands

of child dead of tuberculous meningitis. The pathologist who performed the autopsy says that this case "is the clearest one of primary intestinal tuberculosis ever seen by him".

The culture morphologically and culturally, says Ravenel, corresponds more nearly to the bovine type than to the human and possessed great pathogenic power for cattle. A second culture designated "U" obtained from the mesenteric glands of a child whose death was due to tuberculous meningitis, has shown a virulence far in excess of that usually found in human cultures, though it falls short of culture "BB" in pathogenicity. This culture when first isolated was considered by Ravenel a typical human culture, but later after 12 subcultures on glycerine agar, it was shown to have sufficient virulence to kill a calf. Smith (27) regards this culture probably human tubercle bacilli.

Culture "M" isolated from human sputum showed marked increase in virulence during passage through a number of calves.

Fife and Ravenel (30) report a case of tabes mesenterica due to the bovine tubercle bacilli.

Smith (6) records his observations on 7 cultures obtained from phthisical sputum and 6 cultures of bovine origin.

All of the human cultures resembled each other, and all of the bovine resembled each other. The difference between the human and bovine was considered by Smith to be sufficiently well marked to justify the establishment of two varieties. From his studies on these cultures we may conclude that in case of all the cultures obtained from human sputum the human type of bacilli was present, and all of the bovine culture consisted of the bovine bacilli.

Smith (31) reports a study of the tubercle bacilli isolated from 3 cases of tuberculosis of the mesenteric lymph nodes. In all these cases the anatomical findings at autopsy pointed to probable primary intestinal infection, but the bacilli isolated in all three cases proved to be of the human type.

He also (29) reports the study of the tubercle bacilli from 2 cases of primary tuberculosis of the mesenteric glands in children; in one of which he found bovine tubercle bacilli, while in the other human tubercle bacilli.

Lartigau (32) studied cultures from 19 human sources and found one culture which he considered according to Theobald Smith's classification, bovine in origin.

Vagades (33) studied the virulence of tubercle bacilli from 28 human and 2 bovine sources. The human cultures were all obtained from sputum, or lungs at autopsy, except in one case which was a culture isolated from a gland. One of these cultures (obtained from the lungs at autopsy) showed morphological and cultural characteristics similar to bovine tubercle bacilli and a pathogenicity for rabbits equal to the bovine bacilli. Smith (29) considers it bovine.

Fibiger and Jensen (34) report a study of the tubercle bacilli isolated from five cases of intestinal tuberculosis, two occurring in adults and three in children. The authors conclude on a basis of the virulence of the bacilli for cattle, that the bacilli from the three cases in children were of the typus bovinus.

They (35) report investigations on the bacilli from five more cases, in three of which they regard the evidence of primary intestinal infection as conclusive and in the other two as very probable, although at autopsy, slight lesions were found in the lungs in addition to the intestinal lesions. In two out of these five cases bacilli fully virulent for cattle were found.

The same authors (36) report two further cases of primary intestinal tuberculosis occurring in children from which they isolated bacilli highly virulent for cattle.

Westenhoeffer (38) has reported a case of primary intestinal tuberculosis in a four-year old girl, material from which when inoculated into a calf, set up a progressive generalized tuberculosis.

Ebers (39) has carried out extensive and careful inoculation experiments on calves with tuberculous material obtained from five cases of intestinal and mesenteric gland tuberculosis in children. From two of these cases bacilli were obtained of such a grade of virulence for cattle that they may be regarded as belonging to the typus bovinus.

de Schweinitz, Dorset, and Schroeder (40) have investigated cultures from nine cases of human tuberculosis, of which they give the histories. Five of these cultures were obtained from the lungs or sputum of cases of pulmonary tuberculosis; two from mesenteric glands and two from peritoneal tubercles. All were passed through guinea pigs before cultivation on artificial media. Two of these nine cultures, one from a mesenteric gland of a 12-year old girl and one from a peritoneal tubercle of a 5-year old boy, exhibited a virulence for calves which entitle them to be classed as bovine tubercle bacilli.

Doubtless there are other well authenticated cases reported in the literature in which bacilli of the bovine type have been isolated from human tuberculosis but the cases collected above are sufficient for definite conclusions.

To summarize briefly; out of 306 cases in which the variety of bacillus present has been determined 63 or a little over 20 per cent were due to the bovine type of bacillus.

Investigated by	Total number cases investigated.	Number cases in which bovine bacilli were found.
British Commission	60	14
German Commission	138	22
Lewis	15	9
Duval	4	1
Ravenel	2	1
Fife and Ravenel	1	1
Theobald Smith	12	1
Lartigau	19	1
Vagades	28	1
Fibiger and Jensen	12	3
Westenhoeffer	1	1
Ebers	5	3
de Schweinitz, Dorset and Shroeder	9	2
	306	63

In considering the individual series of cases investigated by different men one is struck by the great relative difference in frequency with which different investigators found the bovine bacilli. For example Lewis in fifteen cases examined found bovine bacilli in nine cases, while on the other hand Vagades investigating 28 cases found the bovine type only once.

This difference is readily explained by the selection of the cases. Lewis' were all cases of cervical adenitis while Vagades obtained his cultures either from the sputum or the lungs at autopsy in all except one case.

CONCLUSIONS.

1. The clinical cases collected in the first part of this paper, in which the circumstantial evidence points more or less strongly to human beings having been infected with tuberculosis from bovine sources, cannot be presented as furnishing absolute proof of the question, but they point so strongly to tuberculous cattle as a source of danger to man that with such evidence alone before us it would seem advisable to take strict precautions against bovine tuberculosis.

2. The economic losses among the cattle themselves, aside from any possible danger to man, are sufficiently great to demand a vigorous effort to stamp out bovine tuberculosis.

3. The evidence furnished by autopsy statistics of primary intestinal tuberculosis, reported by different observers, is very conflicting, and even if there was agreement on a high incidence, this evidence could only be taken as circumstantial, since there is abundant opportunity for primary intestinal infection to occur with tuberculous material of human origin.

4. The use of tuberculins from human and from bovine bacilli has not yet thrown much light on the question. The agglutination reaction does not serve to differentiate the two types of bacilli.

5. It seems definitely established that there are two distinct types of tubercle bacilli; the human and the bovine type, which in a majority of cases investigated, have characteristics sufficiently fixed so that mutation from one type into the other does not occur.

6. The bovine type of bacillus has been demonstrated in 20 per cent of a series of 306 cases among human beings.

7. The bacillus which causes bovine tuberculosis may also cause tuberculosis in man. It must be borne in mind that every case of tuberculosis in man showing the bovine bacillus need not have received the infection directly from cattle for it is easily conceivable that a human having become infected from cattle may pass the infection on to other human beings.

8. The dangers from bovine tuberculosis to man are sufficiently great to warrant strict precautions against it.

BIBLIOGRAPHY.

1. Koch: Mitth. a. d. Gesundheitsamt, Vol. II, 1884. (Trans. by the New Sydenham Soc., 1886.)
2. Rabinowitsch: Trans. Brit. Cong. on Tuberculosis, Vol. III, 1901.
3. Adami: Canad. J. M. and S., Vol. VI, No. 6, 1899.
4. Ernst: Am. J. M. Sc., N. S. Vol. 98, 1899.
5. Ravenel: Maryland M. J., Vol. 47, 1904.
6. Smith: Tr. Ass. Am. Phys., Vol. XIII, 1898.
7. Chauveau: Cong. p. l'étude de la tuberculose, Paris, 2d Session, 1891.
8. Bovaird: Med. Rec. Vol. 67, 1905.
9. Tscherning: Cong. p. l'étude de la tuberculose, Paris. 1ère Ses. 1888.
10. Pfeiffer: Ztschr. f. Hyg., Vol. 3, 1888.
11. Smith: J. Exper. M., Vol. 3, 1898.
12. Ravenel: Proc. Path. Soc., Phila., N. S. Vols. 3 and 5.
13. Hartzell: J. Am. M. Ass., Vol. 30, 1898.
14. Ebers: Lubarsch u. Ostertag, Vol. 4, page 868, 1899.
15. Bovaird: Arch. Pediat., Vol. 18, 1901.
16. Sladen: Lancet, Vol. 2, 1901.
17. McFadyean: Trans. Brit. Cong. on Tuberculosis, Vol. 1, 1901.
18. Ravenel: Rep. XIV Internat. Cong. on Hyg. and Demog., Berlin, 1907.
19. Still: Brit. M. J., Vol. II, 1899.
20. Thorn: The Harbin Lectures, 1898, Lancet, Vol. II, 1898.
21. Kitisato: Ztschr. f. Hyg., Bd. 48, 1904.
22. Baldwin: Osler's Modern Medicine, Vol. 3, p. 188.
23. Detre: Wiener klin. Wchnschr., XXI, No. 6.
24. Raw: Med.-Chir. Tr., London, Vol. 90.
25. Arloing and Courmont: Rev. de la Tuberculose, No. 3, 1904.
26. Lister: Trans. Brit. Cong. on Tuberculosis, Vol. I, 1901.
27. Sec. Inter. Rep. Roy. Com. on Hum. and Anim. Tuberculosis, Part I, 1907.
28. Arb. a. d. Gesundheitsamt. Kais. Vol. VI.
29. Smith: J. M. Research, Vol. 8, 1904-5, p. 296.
30. Fife and Ravenel: Proc. Path. Soc., Phila., N. S. Vol. 8, 1905.
31. Smith: Am. J. M. Sc., N. S. Vol. 128, 1904.
32. Lartigau: J. M. Research, Vol. I, 1901.
33. Vagades: Ztschr. f. Hyg., Vol. 28, 1908.
34. Fibiger and Jensen: Berl. klin. Wchnschr., 1902, p. 884.
35. Fibiger and Jensen: Berl. klin. Wchnschr., 1904, Nos. 6 and 7.
36. Fibiger and Jensen: Berl. klin. Wchnschr., 1907, No. 4.
38. Westenhoeffer: Berl. klin. Wchnschr., 1903, No. 14.
39. Ebers: Beitr. z. Klinik d. Tuberkulose, Bd. 3, 1905.
40. de Schweinitz, Dorset and Schroeder: U. S. Dept. Agriculture, Bureau Animal Industry, Bulletin 52, Part II.

DR. ADAM THOMSON, THE ORIGINATOR OF THE AMERICAN METHOD OF INOCULATION FOR SMALL-POX.[1]

By HENRY LEE SMITH, M. D., Baltimore.

Dr. Adam Thomson was born and educated in Scotland. The exact date and place of his birth have not been ascertained, but, it is said, that he was on his way to Leith to claim his share of the family estate when he sickened and died in New York in the year 1767. In his memorable and eloquent Discourse on the Preparation of the Body for the Small-pox and the Manner for Receiving the Infection, he refers to

[1] An address read before the Johns Hopkins Hospital Historical Club, November 9, 1908.

"the famous Monro of Edinburgh" as one of his first masters in the healing art.

He settled in Prince George's County, in the Province of Maryland, early in the eighteenth century. In 1748 he went to Philadelphia where he continued the practice of his profession, his services being in demand throughout the colonies because of his eminence and success as an inoculator.

Dr. Thomson was one of the original members of the Philadelphia Assembly (1748); a founder of the St. Andrew's Society of Philadelphia in 1749, and vice-president of that body in 1751. He is credited with the leadership in the organization of the St. Andrew's Society of the State of New York, having been elected the first vice-president in 1756; and its president the succeeding year.

In 1738 he began his method of preparing the body for small-pox. It consisted of a two-weeks' course of treatment, or "cooling regimen" preparatory to inoculation, to wit: a light, non-stimulating diet, the administration of a combination of mercury and antimony, and moderate bleeding and purgation. He admitted that Boerhaave's[2] Aphorism No. 1392 advanced the "hint" that mercury and antimony properly prepared and administered "might act as an antidote for the variolous contagion." Dr. Thomson's phenomenal success with the method convinced him that "mercury under proper management is more of a specific agent against the effects of the variolous than the venereal poison." He was careful to give it within the bounds of salivation and to modify the regimen to suit the patient's age and constitution.

In his Discourse he says: "On every occasion, for the space of twelve years that I have been called upon to prepare people for the small-pox, either for receiving it in the natural way, or by inoculation (for I have prepared many for both), I have constantly us'd such a medicine as mention'd, and I can honestly declare that I never saw one so prepar'd in any considerable danger by the disease."

After the preparatory treatment, Dr. Thomson preferred his patients to receive the infection by inoculation rather than by exposing them to small-pox itself; his experience having shown that those inoculated escaped severe sore throat, and, usually, had a milder type of the disease than those allowed to contract it by direct contact. He inoculated on the leg, because he was of the opinion that the seat of local reaction should be at a point most distant from the brain and vital organs. To prevent or remedy a troublesome sore he advised "about 3 or 4 half drams of Jesuit's bark given at so many doses during the day."

His explanation of the manner in which immunity is acquired against small-pox is most interesting, and suggests to readers of to-day Pasteur's exhaustion hypothesis. He states: "It appears to me then highly probable, that there is a certain quantity of an infinitely subtile matter, which may be called the *variolous fuel*, equally, intimately and universely diffused through the blood of every human creature, in some more, in others less, that lies still and quiet in the body, never showing itself in any manner hitherto discovered, until put in action by the *variolous contagion*, at which time it is totally expelled by the course of the disease." He believed that mercury and antimony mitigated the malignant quality of the variolous fuel.

Dr. Thomson found the average medical practitioner of America poorly educated, and therefore a source of danger in the community. He recommends in the Discourse that the legislature interpose in behalf of the safety of the people and appoint proper persons to judge of the qualifications of those permitted to practice. To prevent harmful results from the use of his method in the hands of the uneducated, he says: "I have purposely avoided giving any formal directions about the preparation, thinking it sufficient to propose the general intentions to be pursued, which every judicious physician easily knows how to execute, and adapt to different constitutions; for I think none else ought to be entrusted with a matter of this sort. Nor do I mean by such, all those who by the courtesy of *America* are stil'd doctors, because it is well known that surgeons, apothecaries, chymists, and druggists or even mere smatterers in any of these, are all promiscuously call'd by that title, as well as real physicians."

Dr. Thomson delivered his Discourse on the Preparation of the Body for the Small-pox before the trustees and others in the Academy of Philadelphia, on Wednesday, November 21, 1750.[3] It was published the same year by Benjamin Franklin; reprinted in London in 1752, and in New York in 1757. It met with favorable reviews in America, England and France. Dr. George W. Norris, of Philadelphia, who had been unable to obtain the work, comments as follows: "It is spoken of as being written in a modest and plain style, the arguments made use of as highly plausible, and the author as actuated with a generous desire to communicate salutary advice in the management of a distemper which has proved fatal to multitudes." (The Early History of Medicine in Philadelphia, Geo. W. Norris, 1886, p. 106.)

Dr. Thacher (Amer. Med. Biography, 1828, Vol. I, p. 66) refers to the Discourse in the following manner: "This production was highly applauded both in America and Europe, as at that period (1750) the practice of inoculation was on the decline. The author states that inoculation was so unsuccessful at Philadelphia that many were disposed to abandon the practice; wherefore, upon the suggestion of the 1392'd Aphorism of Boerhaave, he (Thomson) was led to prepare his patients by a composition of antimony and mercury, which he had constantly employed for twelve years, with uninterrupted success."

[2] Boerhaave's Aphorism, 1392: "Some success from antimony and mercury prompts us to seek for a specific for the small-pox in a combination of these two minerals, reduced by art, to an active, but not to an acrimonious or corrosive state."

[3] An original Franklin print of the Discourse, probably the only one extant, is on file in the library of the Surgeon-General's Office, Washington, D. C. Copies of it may be seen in the libraries of the Johns Hopkins Hospital, the Medical and Chirurgical Faculty of Maryland and of the College of Physicians, Philadelphia.

Drs. Redman and Kearsley of Philadelphia, and others, first opposed the method, but later it was universally adopted in the colonies and was favorably received abroad. In England it was used and recommended by Huxham, Andrew, Baker and others. de La Condamine, in France, recorded the success it had brought the English and American inoculators, and mentioned that the method was upheld by a New York physician in his Leyden thesis in 1764.[4] It soon became known as the American method of inoculation, and was employed with gratifying results, notably by Dr. Gale of Connecticut, Dr. Alexander Garden of Charleston, South Carolina, Dr. McKane of New Jersey, and by Dr. Alexander Hamilton of Maryland, who wrote ably in its defense. It was introduced as routine procedure in the first inoculating hospitals which were established near Boston, Mass., in February, 1764. Dr. William Barnett was called from Philadelphia to supervise the work because of his reputation there as a successful inoculator.

In describing the success of the method in the Transactions of the Philosophical Society for 1765, Dr. Gale makes this statement: "A. D. 1764. At this present writing, the small-pox is prevalent in the town of Boston; by the last accounts, 3000 had recovered from inoculation in the new method, by the use of mercury, and 5 only had died, viz., children under 5 years of age; so that it appears, that death without inoculation is 1 in 7 or 8; by inoculation without mercury, 1 in 80 or 100; *by inoculation with mercury, 1 in 800 or 1000.*" Dr. Gale in error, *ibid.*, styles Dr. Thomson "Dr. Thomas of Virginia," who, he says, began the "new method" with Dr. Murison of Long Island and several others in 1745. As a matter of fact, Dr. Thomson started his preparatory treatment seven years previously, in the Province of Maryland and carried on this pioneer work unaided by others.

In 1762 there appeared on November 25, in the Maryland Gazette, a long and scholarly letter written by Dr. Thomson, in which he laments the fact that his method of inoculation had been taken up by quacks, and reduced by them to "a matter of merchandise." He particularly condemns a certain Mr. Barnard of New Jersey, whom he styles "a man of little or no education in physic, or indeed in anything else," and also "the Jersey secret monger." It seems that Barnard had learned the details of Dr. Thomson's "cooling regimen" from a reputable physician, and had used it in 1000 cases with but two or three deaths, and these occurred "in very young children who were said to have died of other disorders." Barnard gave Dr. Thomson no credit for his success, but spoke of the drugs used as "specific remedies." He was known to have sold the secret of the "specific remedies" to other charlatans for a "piece of money." And further we read, that among a number of physicians in and about Philadelphia, who, from the first, had tried to bring Dr. Thomson's method into disrepute, was one, "Dr. J. R.," of New Jersey. This physician, Dr. Thomson tells us, after having openly ridiculed the method, as described in the Discourse, published some years later in one of the Philadelphia newspapers (ostensibly for the good of humanity) an account of the great success he had experienced in inoculating individuals, who had previously been put upon a course of mercury and antimony. He claimed with real cunning and with great injustice to Dr. Thomson that he found the source of inspiration for the *new method* in the writings of Boerhaave.

On the other hand, in the letter quoted, Dr. Thomson writes: "It gives me pleasure to do justice to the judgment and candour of Dr. McKane of New Brunswick in the Jerseys, on this occasion; for he inoculated a very considerable number, the same time with Mr. Barnard, but was so far from acting the mean and ungrateful part complained of, that he honestly owned all of his patients were prepared in the manner directed in my Discourse . . . . and he told me further, that he never gave his preparatory medicines in such a manner as to affect the salivary glands, and his success was very great, having never had a patient, so prepared, in the smallest danger." Again (*loc. cit.*) he thanks Dr. Alex. Garden, of Charleston, S. C., for his honesty in stating in public there that the uncommon success following the inoculation of a great number of individuals during a very fatal epidemic of small-pox in 1759, was entirely due to the employment of the method recommended in the Discourse.

In conclusion the writer wishes to emphasize the fact that Dr. Thomson's claim of the specificity of calomel in small-pox, "when used under proper management," *was strongly supported by the experience* of many impartial and trustworthy physicians. Moreover, we have seen that even quacks who employed the method somewhat at random, increased their reputation by the good results obtained from the use of mercury. Hence it would seem reasonable to assume that had inoculation not been superseded by vaccination, the American method of preparing the body for small-pox would have remained, with but slight modification, the most rational means of reducing the mortality during disastrous epidemics of the disease.

Dr. Thomson married the widow of James Warddrop, Esq., of Virginia. She was Lettice Lee, daughter of Philip Lee, of Virginia, and a great grand-daughter of Richard Lee, the emigrant. After Dr. Thomson's death, she married Col. Joseph Sim.[5] She had issue by Dr. Thomson only, Mary Lee Thomson, who married Col. Lilburn Williams, of Maryland, and Alice Corbin Thomson, who married Captain John Hawkins, a gallant officer of the 3d Virginia regiment of the Revolutionary Army.

[4] "Un médecin de la Nouvelle Yorck, en Amérique soutint à Leyde l'année dernière une thèse en faveur de cette methode," etc.

[5] From the Maryland Gazette, Thursday, April 11, 1776: "Prince George's County, Maryland, April the 7th, 1776. On Wednesday, the 3d inst., died Mrs. Sim, wife of Col. Joseph Sim, of this county, of a very painful and lingering illness which she supported with uncommon firmness and resolution. This lady possessed many virtues, accomplishments and valuable qualities in a very high degree. Her disconsolate husband and children and numerous relations and friends are left to lament their loss.

Dr. Adam Thomson died in New York City on September 18, 1767.* The following notice of his death appeared three days later in the New York Mercury:

"On Friday morning early, died here, Adam Thomson, Esq., a physician of distinguished abilities in his profession, well versed in polite literature, and of unblemished honor and integrity as a gentleman."

BIBLIOGRAPHY.

American Medical Biography: Thacher, Vol. I, p. 66, 1828.

Baas' History of Medicine: J. H. Vail & Co., p. 802, 1889.

Cordell, Dr. E. F.: The Med. Annals of Maryland, pp. 47, 650, 651, 652, 655, 1903.

de La Condamine: De l'inoculation de la petite vérole. Troisième mémoire, pp. 17, 18, 1765.

Gale, Dr. Benjamin: Trans. Philos. Soc., London, Vol. 55, pp. 194-195, 1765.

Green, Dr. Abbott: Address, Mass. Med. Soc., June 7, 12 Vol., p. 615, 1881.

Griswold, Rufus Wilmot: Republican Court, or American Society in the Days of Washington. Published by D. Appleton & Co., p. 13, 1856.

Hamilton, Dr. Alexander: "A Defence of Doctor Thomson's Discourse on the Preparation of the Body for the Small-pox. Wherein everything that has been yet advanced against it is fairly examined; particularly Dr. Mead's censure of Dr. Boerhaave's opinion concerning a specific antidote, and Mr. Kearsley's remarks. In a letter to a physician in Philadelphia. By Alexander Hamilton, physician at Annapolis, in Maryland. *Philadelphia: Printed by William Bradford, 1751.*" Evan's American Biography, Vol. III, Blakely Press, Chicago, p. 10, 1905.

Lee, Edmund Jennings: Lee of Virginia. Franklin Printing Co., Philadelphia, p. 100, 1895.

Maryland Gaz., November 25, 1762.

Ibid., October 1, 1767.

Ibid., August 25, 1768.

Ibid., April 11, 1776.

Monthly Review of London, April, 1752.

New York Mercury, September 21, 1767.

Norris, Dr. George W.: The Early History of Medicine in Philadelphia, pp. 35, 106, 1886.

Packard: History of Medicine in the United States, pp. 89, 440, 1901.

Quinan, Dr. Jno. R.: Maryland Med. Jour., Vol. X, pp. 114, 132, 1883.

Smith, James: Address to Members of the Legislature of Maryland, 8 V., pp. 35, 1818.

Smith, Margaret Vowell: Captain John Hawkins, American Monthly Magazine, p. 563, May, 1895.

St. Andrew's Society of the State of N. Y.: Historical Sketch, Centennial Celebration, N. Y., 1856.

Ibid., History of St. Andrew's Society of the State of New York, George Austin Morrison, Jr., 1906.

Thomson, Adam: A Discourse on the Preparation of the Body for the Small-pox, and the manner of receiving the Infection, as it was delivered in the Publick Hall of the Academy, before the Trustees and others, on Wednesday, the 21st of November, 1750, Phila., B. Franklin & D. Hall, 1750.

Woodville: History of Inoculation of the Small-pox in Great Britain, pp. 335-355, 1796.

*It has been incorrectly stated by a number of writers, that Dr. Adam Thomson died in Maryland in 1768.

SUMMARIES OR TITLES OF PAPERS BY MEMBERS OF THE HOSPITAL STAFF APPEARING ELSEWHERE THAN IN THE BULLETIN.

AKERMAN, JOSEPH, M. D. Conservative surgery.—*Transactions of the New Hanover County (N. C.) Medical Society*, 1908.

AUER, JOHN, M. D. The purgative inefficiency of the saline cathartics when injected subcutaneously or intravenously. —*Journal of Biological Chemistry*, 1908, IV, 197.

AUER, JOHN, M. D., and MELTZER, S. J., M. D. Peristaltic rush.—*American Journal of Physiology*, 1908, XX, 259.

——— The action of strontium compared with that of calcium and magnesium.—*Ibid.*, 1908, XXI, 449.

——— The antagonistic action of calcium upon the inhibitory effect of magnesium.—*Ibid.*, 1908, XXI, 400.

——— The action of calcium upon the pupil and its relations to the effects of mydriatics.—*Proceedings of the Society of Experimental Biology and Medicine*, 1908, V, 86.

BARKER, LEWELLYS F., M. D. Recent progress in the study of typhoid fever.—*Charlotte Medical Journal*, 1908, XXXII, 245.

——— Medical laboratories: their relations to medical practice and to medical discovery.—*Science*, 1908, XXVII, 601.

BARKER, LEWELLYS F., M. D. Psychotherapy.—*Journal of the American Medical Association*, 1908, LI, 368.

——— The psychic treatment of nervous disorders.—*Kansas City Medical Index-Lancet*, 1908, XXXI, 54.

——— Relations of physicians and pharmacists and the use of the pharmacopeia and national formulary.—*Maryland Medical Journal*, 1908, LI, 1.

——— Psychotherapeutics.—*Transactions of the Association of American Physicians*, 1908, XXIII, 472.

BEALL, K. HEBERDEN, M. D. An aid to inspection.—*Journal of the American Medical Association*, 1908, L, 689.

——— Opsonins and vaccine therapy.—*Texas State Journal of Medicine*, 1908, IV, 15.

——— Acidosis.—*Ibid.*, 1908, IV, 95.

BEALL, K. HEBERDEN, M. D., and MASON, E. M., M. D. Portable blood-pressure apparatus.—*Journal of the American Medical Association*, 1908, L, 1121.

BERRY, J. M., M. D. The Bier-Klapp suction method as an aid to treatment in suppurative conditions of the neck. *Albany Medical Annals*, 1908, XXIX, 399.

BLOODGOOD, JOSEPH C., M. D. The clinical and pathological differential diagnosis of diseases of the female breast.—*American Journal of the Medical Sciences*, 1908, CXXXV, 157.

——— Surgery.—*International Clinics*, 1908, 18th Series, VI, 256.

——— Conservative operations on bone tumors, based on the clinical and pathologic study of their relative degrees of malignancy.—*Journal of the American Medical Association*, 1908, L, 325.

——— Surgical pathology.—*Medical Sentinel*, 1908, XV, 563.

——— Inflammations and tumors of the female breast.—*Kelly-Noble Gynecology*, 1908, II, 180.

——— Fractures, dislocations, anesthesia, tumors, infections and surgery of the extremities.—*Progressive Medicine*, 1908, IV, 119.

BLUMER, GEORGE, M. D. Thomas Sydenham.—*Albany Medical Annals*, 1908, XXIX, 199.

——— Some phases of appendicitis; the relation of appendicitis to gall-bladder disease; hæmorrhage from the stomach after appendicitis.—*Yale Medical Journal*, 1908, XIV, 147.

——— The medical aspects of hernia in the linea alba.—*Ibid.*, 1908, XV, 19.

——— Report of a case illustrating the relation of trauma to diabetes mellitus. *Ibid.*, 1908, XV, 177.

——— Chapter on thrombosis, embolism and phlebitis.—*Osler's Modern Medicine*, 1908, IV, 503.

——— Some observations on Grocco's sign.—*Proceedings of the Connecticut State Medical Society*, 1908.

BOGGS, THOMAS R., M. D. Amœbic dysentery in Southern United States.—*Virginia Medical Semi-monthly*, 1908, XIII, 9-12; also *Transactions Tri-State Medical Association*, 1908.

——— Some clinical aspects of blood coagulation.—*International Clinics*, 1908, 18th Series, I, 31-40.

BRANCH, J. R. B., M. D., and CUSHING, HARVEY, M. D. Experimental and clinical notes on chronic valvular lesions in the dog and their possible relation to a future surgery of the cardiac valves.—*The Journal of Medical Research*, 1908, n. s., XII, 471-486.

BROWN, LAWRASON, M. D. The heart in pulmonary tuberculosis.—*American Journal of the Medical Sciences*, 1908, CXXXVI, 819.

——— The diagnostic and therapeutic use of tuberculin.—*Boston Medical and Surgical Journal*, 1908, CLIX, 97.

——— The diagnosis of early pulmonary tuberculosis.—*New York State Journal of Medicine*, 1908, V, 234.

BROWN, THOMAS R., M. D. Mechanics of respiration and of the respiratory diseases.—*Osler's Modern Medicine*, 1908, III, 549.

——— Splanchnoptosis. Enteroptosis. Glénard's disease.—*Ibid.*, 1908, V, 599.

——— Splanchnoptosis.—*Kelly's Medical Gynecology*, 1908, 573.

——— Splanchnoptosis. Enteroptosis. Glénard's disease.—*International Clinics*, 1908, 18th Series, IV, 47.

BRUSH, CLINTON E., M. D. Vaccine therapy: its practical application.—*The Southern Practitioner*, 1908, XXX, 57.

——— Pernicious anæmia.—*Ibid.*, 1908, XXX, 366.

BUNTING, C. H., M. D. Chronic fibrous myocarditis in progressive muscular dystrophy.—*American Journal of Medical Sciences*, 1908, CXXV, 244.

CALVERT, W. J., M. D. Rôle of venous congestion in compensation of tricuspid insufficiency.—*The Archives of Internal Medicine*, 1908, I, 277.

CAMAC, C. N. B., M. D. Non-fatal coma in the course of diabetes.—*American Journal of the Medical Sciences*, 1908, CXXXVI, 839; also *Transactions of the Association of American Physicians*, 1908, XXIII, 519.

CHURCHMAN, JOHN W., M. D. Die Grenzgebiete zwischen innere Medizin und Haut- und Geschlechtskrankheiten.—*Dermatologischer Jahresbericht*, 1908, I.

CHURCHMAN, JOHN W., M. D., and OSLER, WILLIAM, M. D. Chapter on Syphilis.—*Osler's Modern Medicine*, 1908, III, 436.

CLARK, JOHN G., M. D. The surgical phases of enteroptosis.—*Surgery, Gynecology and Obstetrics*, 1908, VI, 339.

——— Gynecological instruction.—*University of Pennsylvania Medical Bulletin*, 1908, XXI, 114.

——— The Gould stitch.—*Ibid.*, 1908, XXI, 136.

——— University influences. Address read at the opening of the Medical Department of the University of Pennsylvania, September 25, 1908.—*Ibid.*, 1908, XXI, 239.

——— Remote results of surgical operations.—*Proceedings of the Schuylkill Valley Medical Association*, 1908.

COHOE, BENSON A., M. D. Typhoid fever during pregnancy.—*Canada Lancet*, 1908, XLI, 663.

——— The placental transmission of *B. typhosus* with report of case.—*American Journal of Obstetrics*, 1908, LVII, 789.

COOK, HENRY W., M. D. Psychotherapy.—*Old Dominion Medical Journal*, 1908, VII, 90.

——— The choice of a vaso-dilator and the indications for vaso-dilation.—*Journal of the American Medical Association*, 1908, L, 676.

COOK, HENRY W., M. D. The cardio-vascular system in prognosis, with special reference to life insurance examinations.—*Ibid.*, 1908, LI, 1692.

CULLEN, ERNEST K., M. B., ERLANGER, JOSEPH, M. D. and BLACKMAN, JULIAN, M. D. Further studies in the physiology of heart block in the dog.—*American Journal of Physiology*, 1908, XXI, 18.

CULLEN, THOMAS S., M. D. Adenomyoma of the uterus.—*W. B. Saunders Co.*, Philadelphia, 1908, pp. 270.

——— Adenomyoma of the uterus.—*Journal of the American Medical Association*, 1908, L, 107.

CUSHING, HARVEY, M. D. Surgery of the head. *Keen's Surgery*, 1908, III, 17.

——— Technical methods of performing certain cranial operations.—*Surgery, Gynecology and Obstetrics*, 1908, VI, 227-246; also *Interstate Medical Journal*, 1908, XV, 171.

——— Subtemporal decompressive operations for the intracranial complications associated with bursting fractures of the skull.—*Annals of Surgery*, 1908, XLVII, 641-644.

CUSHING, HARVEY, M. D., and BRANCH, J. R. B., M. D. Experimental and clinical notes on chronic valvular lesions in the dog and their possible relation to a future surgery of the cardiac valve.—*Journal of Medical Research*, 1908, n. s., XII, 471-486.

CUSHING, HARVEY, M. D., and BORDLEY, JAMES, M. D. Subtemporal decompression in a case of chronic nephritis with uremia.—*American Journal of the Medical Sciences*, 1908, CXXXVI, 484.

CUSHING, HARVEY, M. D., and SLADEN, FRANK J., M. D. Obstructive hydrocephalus following cerebrospinal meningitis, with intraventricular injection of anti-meningitis serum (Flexner).—*Journal of Experimental Medicine*, 1908, X, 548.

CUSHING, HARVEY, M. D., and THOMAS, H. M., M. D. Removal of a subcortical cystic tumor at a second-stage operation without anesthesia.—*Journal of the American Medical Association*, 1908, L, 847-856.

DUFFY, RICHARD N., M. D. A case of myxœdema simulating Bright's disease; with a note on the treatment of renal albuminuria by the administration of hydrastis canadensis.—*Charlotte Medical Journal*, 1908, LVIII, 163.

DUNTON, W. RUSH, M. D. The nervous and mental manifestations incident to school life.—*New York Medical Journal*, 1908, LXXXVII, 258.

——— Mental state of the blind.—*American Journal of Insanity*, 1908, LXV, 103.

EMERSON, CHARLES P., M. D. Clinical diagnosis.—*J. B. Lippincott & Co.*, Philadelphia, 1908, Second Edition.

——— Essentials of medicine.—*J. B. Lippincott & Co.*, Philadelphia, 1908.

EMERSON, CHARLES P., M. D. Duty of the medical profession in fighting the social evil.—*Maryland Medical Journal*, 1908, LI, 18-21.

ERLANGER, JOSEPH, M. D. A new criterion of the estimation of the systolic blood pressure in man.—*American Journal of Physiology*, 1908, XXI, 19.

——— Irregularities of the heart resulting from disturbed conductivity.—*American Journal of the Medical Sciences*, 1908, CXXXV, 797.

ERLANGER, JOSEPH, M. D., BLACKMAN, JULIAN R., M. D. and CULLEN, ERNEST K., M. B. Further studies in the physiology of heart block in the dog.—*American Journal of Physiology*, 1908, XXI, 18.

FARRAR, CLARENCE B., M. D. Some origins in psychiatry.—*American Journal of Insanity*, 1908, LXV, 83.

——— Trend of current psychiatry.—*Maryland Journal of Insanity*, 1908, LI, 374.

FINNEY, J. M. T., M. D. Chapter on Pyloroplasty.—*Kelly-Noble Gynecology*, 1908, II, 374.

——— Chapter on Surgery of the breast.—*Keen's Surgery*, 1908, III, 563.

——— Choice of operation in pyloric stenosis.—*American Journal of the Medical Sciences*, 1908, CXXXV, 333.

——— Congenital idiopathic dilatation of the colon (Hirschsprung's disease).—*Surgery, Gynecology and Obstetrics*, 1908, VI, 624.

——— Gas cysts of the intestine.—*Journal of the American Medical Association*, 1908, LI, 1291.

FLEXNER, SIMON, M. D. Tendencies in pathology.—*Science*, 1908, n. s., XXVII, 128.

FLEXNER, SIMON, M. D., and JOBLING, JAMES, M. D. Serum treatment of epidemic cerebro-spinal meningitis.—*Journal of Experimental Medicine*, 1908, X, 141.

——— An analysis of four hundred cases of epidemic meningitis treated with the anti-meningitis serum.—*Ibid.*, 1908, X, 690.

——— Further notes on a rat tumor.—*Proceedings of the Society for Experimental Biology and Medicine*, 1908, V, 91.

FORD, W. W., M. D. The pathology of Amanita Phalloides intoxication.—*Journal of Infectious Diseases*, 1908, V, 116-132.

——— Active immunization with glucosides.—*Science*, 1908, XXVII, 652-657.

FORD, W. W., M. D., and ABEL, J. J., M. D. Further observations on the hæmolysin of Amanita Phalloides.—*Schmiedeberg Festschrift. Archiv für experimentelle Pathologie und Pharmacologie*, 1908.

——— Further observations upon the poisons of Amanita Phalloides. *Transactions of the Association of American Physicians*, 1908, XXIII, 57.

FOWLER, HENRY A., M. D. Autochthonous urethral calculi; report of a case.—*Medical Record*, 1908, LXXV, 174.

GIFFIN, H. Z., M. D. Some practical points in the physical examination.—*Northwestern Lancet*, 1908.

GILCHRIST, T. CASPAR, M. D. Some experimental observations on the histopathology of urticaria factitia.—*Journal of Cutaneous Diseases*, 1908, XXVI, 122.

GOLDSBOROUGH, F. C., M. D., and SLEMONS, J. MORRIS, M. D. Die geburtshilfliche Bedeutung des Blutdrucks und sein Verhältniss zur Arbeit des Herzens.—*Zentralblatt für Gynäkologie*, 1908, XXXII, 699.

HALSTED, WILLIAM S., M. D. Transplantation of the parathyroid glands.—*Proceedings of the Pathological Society of Philadelphia*, 1908, 11 n. s., 109.

HARRIS, HENRY, M. D. Myelogenous leukemia and its treatment with the X-rays.—*American Journal of the Medical Sciences*, 1908, CXXXVI, 78-86.

HEMENWAY, JOSEPHINE, M. D. Two cases of acute meningitis of the convexity.—*Archives of Pediatrics*, 1908, XXV, 207.

HIRSCHFELDER, ARTHUR D., M. D. Recent studies on the circulation and their importance to the practice of medicine.—*Journal of the American Medical Association*, 1908, LI, 473.

HOLDEN, GERRY R., M. D. The indications for operation in elective surgery.—*Journal of the American Medical Association*, 1908, L, 418.

——— The treatment of pelvic inflammatory disease.—*The Southern Medical Journal*, 1908, I, 99.

HUNNER, GUY L., M. D. Chapter on Hernia.—*Kelly-Noble Gynecology*, 1908, II, 656.

——— Acute pyelitis due to acute appendicitis.—*Journal of the American Medical Association*, 1908, LI, 142.

HURD, HENRY M., M. D. Psychiatry as a part of preventive medicine.—*American Journal of Insanity*, 1908, LXV, 17.

——— How can psychiatry assist preventive medicine? (Editorial).—*American Journal of Public Hygiene*, 1908, XVIII, 273.

——— The proper length of the period of training for nurses.—*American Journal of Nursing*, 1908, VIII, 671.

HURDON, ELIZABETH, M. D., and KELLY, H. A., M. D. Operations for diseases of the vermiform appendix.—*Kelly-Noble Gynecology and Abdominal Surgery*, 1908, II, 514.

INGRAHAM, CLARENCE B., M. D., and STEINER, WALTER R., M. D. Epidemic cerebrospinal meningitis in Hartford, Connecticut, during 1904-1905, with special reference to the cases treated at the Hartford Hospital.—*American Journal of the Medical Sciences*, 1908, CXXXV, 351.

JACOBS, HENRY BARTON, M. D. The prevention of tuberculosis among school children.—*Maryland Medical Journal*, 1908, LI, 83.

KELLY, HOWARD A., M. D. Chapter on Operations upon the spleen.—*Kelly-Noble Gynecology and Abdominal Surgery*, 1908, II, 595.

——— The surgery of the ureter.—*Ibid.*, 1908, II, 732.

KELLY, H. A., M. D., and HURDON, ELIZABETH, M. D. Operations for diseases of the vermiform appendix.—*Ibid.*, 1908, II, 514.

KNOX, J. H. M., JR., M. D. The relation of the bacilli belonging to the so-called dysentery group to the diarrhœal affections of infancy.—*Archives of Pediatrics*, 1908, XXV, 241.

——— The growth of our knowledge of infectious diseases.—*Maryland Medical Journal*, 1908, LI, 175; 217.

——— Character of stools with reference to the intestinal findings in the diarrhœal diseases of infants.—*Journal of the American Medical Association*, 1908, LI, 1306.

——— The diarrhœal disorders of infants.—*International Clinics*, 1908, 18th Series, III, 150.

——— The recent campaign for pure milk in Baltimore.—*Archives of Pediatrics*, 1908, XX, 605.

KNOX, J. H. M., JR., M. D., and MEAKINS, J., M. D. The urinary findings in a series of infants suffering from intestinal infection.—*Archives of Medicine*, 1908, II, 241.

KNOX, J. H. M., JR., M. D., and SLADEN, F. J., M. D. Hydrocephalus of meningococcus origin, with a summary of recent cases treated by anti-meningitis serum.—*Archives of Pediatrics*, 1908, XXV, 761.

LYMAN, DAVID R., M. D. The notification of tuberculosis.—*Yale Medical Journal*, 1908, XIV, 158.

LYON, IRVING P., M. D. Chapter on diseases of the spleen.—*Osler's Modern Medicine*, 1908, IV, 735.

——— The radical cure of habitual constipation by psychotherapy.—*Transactions of the Association of American Physicians*, 1908, XXIII, 482.

MACCALLUM, W. G., M. D. The physiology and pathology of the parathyroid glands.—*Proceedings of the Pathological Society of Philadelphia*, 1908, n. s., XI, 115.

MACCALLUM, W. G., M. D., and VOEGTLIN, CARL, M. D. Ueber die Beziehung der Parathyroides zum Calciumstoffwechsel und ueber die Natur der Tetanie.—*Centralblatt für die Grenzgebiete der Medizin und Chirurgie*, 1908, XI, 209.

MACCALLUM, W. G., M. D., and VOEGTLIN, CARL, M. D. On the relation of the parathyroid gland to calcium metabolism and to tetany.—*Transactions of the Association of American Physicians*, 1908, XXIII, 365.

McCrae, Thomas, M. D. Diffuse dilatation of the aorta.—*Canada Lancet*, 1908, XLI, 821.

——— The treatment of typhoid fever.—*Journal of the American Medical Association*, 1908, LI, 983.

Marshall, Harry T., M. D. Yaws: a histologic study.—*Philippine Journal of Science*, 1907, II, 469.

Marshall, H. W., M. D. The etiology of chronic non-tuberculous arthritis. *The Journal of the American Medical Association*, 1908, LI, 890.

Mason, E. M., M. D. The value of laboratory methods to the clinician, with report of illustrative cases.—*Transactions Alabama Medical Association*, 1908.

Mason, E. M., M. D., and Beall, K. H., M. D. Portable blood-pressure apparatus.—*Journal of the American Medical Association*, 1908, L, 1121.

Meloy, C. R., M. D., and Winternitz, M. C., M. D. On the occurrence of catalase in human tissues and its variations in diseases.—*Journal of Experimental Medicine*, 1908, X, 739.

Meyer, Adolf, M. D. The rôle of the mental factors in insanity.—*American Journal of Insanity*, 1908, LXV, 39.

——— The problem of the public care of the insane.—*Illinois Medical Journal*, 1908, XIV, 594.

——— What do histories of cases of insanity teach us concerning preventive mental hygiene during the years of school life?—*Psychological Clinic*, II, 4.

——— The relation of the auditory centre to aphasia.—*Transactions of the Association of American Physicians*, 1908, XXIII, 116.

Miller, G. Brown, M. D. Complications following operations.—*Kelly-Noble Gynecology and Abdominal Surgery*, 1908, II, 1-78.

Miller, Robert T., M. D. Treatment of tetanus with subarachnoid injections of magnesium sulphate.—*American Journal of the Medical Sciences*, 1908, CXXXVI, 781.

Mitchell, James F., M. D. Local anesthesia. Extent to which local anesthesia has been adopted in America.—*Journal of the American Medical Association*, 1908, LI, 1582.

Moss, W. L., M. D. Traumatic pneumothorax.—*Journal of the American Medical Association*, 1908, LI, 1971.

Moulton, W. Bean, M. D. Cancer of the uterus. Our present means of lessening its mortality.—*Transactions of the Maine Medical Association*, 1908.

Norris, Charles C., M. D. The omentum, its histology, anatomy and physiology in health and disease.—*University of Pennsylvania Medical Bulletin*, 1908, XXI, 138.

——— The study of nine cases of dysmenorrhœa.—*Ibid.*, 1908, XXI, 140.

Norris, Charles C., M. D. The omentum as a factor in abdominal surgery.—*Transactions Philadelphia Obstetrical Society*, 1908.

Norris, Charles C., M. D., and Mitchel, W. C. B., M. D. Primary ovarian pregnancy.—*Surgery, Gynecology and Obstetrics*, 1908, VI, 460-462.

Opie, Eugene L., M. D. The effect of injected leucocytes upon the development of a tuberculous lesion.—*Journal of Experimental Medicine*, 1908, IX, 419.

——— Diseases of the pancreas.—*Osler's Modern Medicine*, 1908, V, 621.

——— Surgery of the pancreas.—*Kelly-Noble Gynecology and Abdominal Surgery*, 1908, II, 557.

Opie, Eugene L., M. D., and Barker, Bertha I., M. D. Enzymes of tuberculous tissue.—*Journal of Experimental Medicine*, 1908, X, 645.

Osler, William, M. D. Remarks on the functions of an outpatient department.—*British Medical Journal*, 1908, I, 1470.

——— Splenic enlargements other than leukæmic.—*Ibid.*, 1908, II, 1151.

——— A clinical lecture on erythema (polycythæmia with cyanosis, *maladie de Vaquez*).—*Lancet*, 1908, I, 143.

——— Note on French and German for medical students.—*Ibid.*, 1908, II, 957.

——— The pneumococcus infections.—*The Clinical Journal*, 1908, XXXI, 295.

——— Vienna after thirty-four years.—*Journal of the American Medical Association*, 1908, L, 1523.

——— Endocardites infectieuses chroniques.—*La Tribune Médicale*, 1908. Série nouvelle, 773.

——— Chapter on diseases of the arteries.—*Osler's Modern Medicine*, 1908, III, 426.

——— Chapter on aneurism.—*Ibid.*, 1908, III, 448.

Osler, William, M. D., and Churchman, John W., M. D. Chapter on Syphilis.—*Osler's Modern Medicine*, 1908, III, 436.

Penrose, Clement A., M. D. The psychic treatment of nervous diseases from a practical standpoint.—*New York Medical Journal*, 1908, LXXXVII, 115.

Pleasants, J. Hall, M. D. Prevention of the nervous and mental disorders incident to school life.—*New York Medical Journal*, 1908, LXXXVII, 111.

Reed, Jewett V., M. D. Pragmatism and medicine.—*Indiana Medical Journal*, 1908, XXVI, 480.

——— The surgical treatment of exophthalmic goitre.—*Journal of the Indiana State Medical Association*, 1908, V, 375.

REED, JEWETT V., M. D., and THURSTON, H. S., M. D. The practical application of opsonic therapy.—*Journal of the Indiana State Medical Association*, 1908, I, 219.

REIK, HENRY O., M. D. Eye strain as a cause of headache.—*Old Dominion Medical Journal*, 1908, VII, 113.

RIGGS, THEODORE F., M. D. Gaspard Tagliacozzi.—*Albany Medical Annals*, 1908, XXIX, 755.

ROBB, HUNTER, M. D. Report of two cases of ectopic gestation.—*Cleveland Journal of Medicine*, 1908, VII, 504.

——— An experimental study of hæmorrhage following section of the uterine and ovarian vessels in dogs and its possible bearing on ruptured pregnancies.—*American Journal of Obstetrics and Diseases of Women*, 1908, LVIII, 577.

——— Ruptured tubal pregnancy—when shall we operate?—*Journal of the American Medical Association*, 1908, LI, 1767.

——— A case of suspension of the uterus followed by two normal deliveries and the findings at a subsequent abdominal section.—*Read before the Lakeside Hospital Medical Society*, April, 1908.

ROUS, F. PEYTON, M. D. An inquiry into some mechanical factors in the production of lymphocytosis.—*Journal of Experimental Medicine*, 1908, X, 230.

——— The effect of pilocarpine on the output of lymphocytes through the thoracic duct.—*Ibid.*, 1908, X, 329.

——— Some differential counts of the cells in the lymph of the dog: their bearing on problems in hæmatology.—*Ibid.*, 1908, X, 537.

SABIN, FLORENCE R., M. D. Further evidence on the origin of the lymphatic endothelium of the blood vascular system.—*Anatomical Record*, 1908, II.

SAMPSON, JOHN A., M. D. The clinical manifestations of uterine cancer.—*International Clinics*, 1908, 18th Series, II, 176.

——— Suggestions in teaching gynecology, with demonstration of special (mechanical) charts as an aid in this work.—*Surgery, Gynecology and Obstetrics*, 1908, VII, 34.

——— The significance of uterine bleeding.—*New York State Journal of Medicine*, 1908, VIII, 507.

SAMPSON, JOHN A., M. D., and PEARCE, RICHARD M., M. D. A study of experimental reduction of kidney tissue with special reference to the changes in that remaining.—*The Journal of Experimental Medicine*, 1908, X, 745.

SCHENCK, BENJAMIN R., M. D. Fibromyomata of the uterus and anemia.—*Journal of the American Medical Association*, 1908, LI, 1395.

——— The evolution of obstetrics.—*The Detroit Medical Journal*, 1908, VIII, 77.

SCOTT, J. ALISON, M. D. Perforation of the intestines in typhoid fever.—*International Clinics*, 1908, 18th Series, III, 21.

SIMON, CHARLES E., M. D. A cytolytic factor occurring in the blood serum of malignant disease.—*Journal of the American Medical Association*, 1908, LI, 915.

——— Recent research into the pathology of malignant disease.—*International Clinics*, 1908, 18th Series, II.

SIMON, CHARLES E., M. D., and THOMAS, WALTER S., M. D. On complement fixation in malignant disease.—*Journal of Experimental Medicine*, 1908, X, 673.

SLADEN, FRANK J., M. D. The serum treatment of meningitis.—*Journal of the American Medical Association*, 1908, LI, 1318.

——— The results of the use of Flexner's anti-meningitis serum in the treatment of epidemic cerebrospinal fever.—*Transactions of the Oregon State Medical Association*, 1908.

——— The results of the use of anti-meningitis serum (Flexner) at the Johns Hopkins Hospital.—*Old Dominion Journal of Medicine and Surgery*, 1908, VII, 241.

SLADEN, FRANK J., M. D., and CUSHING, HARVEY, M. D. Obstructive hydrocephalus following cerebrospinal meningitis with intraventricular injection of anti-meningitis serum (Flexner).—*Journal of Experimental Medicine*, 1908, X, 548.

SLADEN, FRANK J., M. D., and KNOX, J. H. M., JR., M. D. Hydrocephalus of meningococcus origin, with a summary of recent cases treated by anti-meningitis serum.—*Archives of Pediatrics*, 1908, XXV, 761.

SLEMONS, J. MORRIS, M. D., and GOLDSBOROUGH, F. C., M. D. Die geburtshilfliche Bedeutung des Blutdrucks und sein Verhältniss zur Arbeit des Herzens.—*Zentralblatt für Gynäkologie*, 1908, XXXII, 699.

SLOCUM, ROBERT B., M. D., Arterio-sclerosis of the uterus.—*Surgery, Gynecology and Obstetrics*, 1908, VI, 352.

STEINER, WALTER R., M. D. The pathology of renal tuberculosis.—*Yale Medical Journal*, 1908, XIV, 154.

——— The opsonins and their relations to bacterial vaccine therapy. *Ibid.*, 1908, XV, 153.

——— Sporadic trichinosis, with report of a case.—*Boston Medical and Surgical Journal*, 1908, CLIX, 720.

STEINER, WALTER R., M. D., and INGRAHAM, CLARENCE B., M. D. Epidemic cerebrospinal meningitis in Hartford, Connecticut, during 1904-1905, with special reference to the cases treated at the Hartford Hospital.—*American Journal of the Medical Sciences*, 1908, CXXXV, 351.

STONE, HARVEY B., M. D. Dermoid tumors of the abdominal wall.—*Annals of Surgery*, 1908, XLVIII, 175.

STONE, HARVEY B., M. D. Recent developments in the history of cancer.—*Virginia Medical Semi-Monthly*, 1908, XIII, 151.

THAYER, W. S., M. D. On the early diastolic heart sound (the so-called third heart sound).—*Boston Medical and Surgical Journal*, 1908, CLVIII, 713; also *Medical Papers Dedicated to Reginald Heber Fitz*, Boston, 1908.

——— On some relations of the physician to the public. Duties and opportunities.—*Journal of the American Medical Association*, 1908, L, 1877.

THOMAS, HENRY M., M. D., and CUSHING, HARVEY, M. D. Removal of a subcortical cystic tumor at a second-stage operation without anesthesia.—*Journal of the American Medical Association*, 1908, L, 847.

TINKER, MARTIN B., M. D. Some difficulties in the diagnosis and surgical treatment of goitre.—*Long Island Medical Journal*, 1908, II, 125.

VANDERHOOF, DOUGLAS, M. D. A clinical method for the determination of the sodium chlorid content of the blood and other body fluids.—*Journal of the American Medical Association*, 1908, LI, 478.

——— Sporadic trichinosis with report of a case.—*Old Dominion Journal of Medicine and Surgery*, 1908, VII, 18.

———Symptomatology and diagnosis of nephritis.—*New York Medical Journal*, 1908, LXXXVII, 537.

——— The rational treatment of indigestion.—*Old Dominion Journal of Medicine and Surgery*, 1908, VII, 356.

VOEGTLIN, CARL, M. D., and MACCALLUM, W. G., M. D. Ueber die Beziehung der Parathyroides zum Calciumstoffwechsel und ueber die Natur der Tetanie.—*Centralblatt für die Grenzgebiete der Medizin und Chirurgie*, 1908, XI, 209.

——— On the relation of the parathyroid gland to calcium metabolism and to tetany.—*Transactions of the Association of American Physicians*, 1908, XXIII, 365.

WARFIELD, LOUIS M., M. D. Arteriosclerosis.—*C. V. Mosby Book & Publishing Co.*, St. Louis, 1908.

——— A case of gonorrhœal arthritis treated with serum.—*Medical Herald*, 1908, XXVII, 358.

——— The cutaneous tuberculin reaction.—*Journal of the American Medical Association*, 1908, L, 687.

——— Some vital points in tuberculosis.—*Interstate Medical Journal*, 1908, XV, 736.

WARFIELD, LOUIS M., M. D. A sketch of the history of the anti-tuberculosis crusade.—*Medical Fortnightly*, 1908, XXXIII, 113.

WATTS, STEPHEN H., M. D. Operative treatment of diseases of the pancreas.—*Kelly-Noble Gynecology and Abdominal Surgery*, 1908, II, 573.

——— The suture of blood vessels and direct transfusion of blood by vascular anastomoses.—*Virginia Medical Semi-monthly*, 1908, XIII, 217.

WELCH, WILLIAM H., M. D. Consideration of the introduction of surgical anæsthesia.—*Boston Medical and Surgical Journal*, 1908, CLIX, 599.

——— Medicine and the university.—*Journal of the American Medical Association*, 1908, L, 1; also *Science*, 1908, n. s., XXVII, 8.

——— What may be expected from more effective application of preventive measures against tuberculosis.—*Albany Medical Annals*, 1908, XXIX, 256.

WIEL, HARRY L., M. D. Angioneurotic edema of the genitals.—*Journal of the American Medical Association*, 1908, L, 1608.

——— Meaningless diagnoses.—*Ibid.*, 1908, L, 1889.

WILLIAMS, J. WHITRIDGE, M. D. Extrauterine pregnancy.—*Kelly-Noble Gynecology and Abdominal Surgery*, 1908, II, 130.

——— Is pubiotomy a justifiable operation?—*American Journal of Obstetrics*, 1908, LVIII, 202.

WINTERNITZ, M. C., M. D., and MELOY, C. R., M. D. On the occurrence of catalase in human tissues and its variations in diseases.—*Journal of Experimental Medicine*, 1908, X, 739.

YATES, JOHN L., M. D. An experimental study of intraperitoneal diffusion with reference to toxin absorptions.—*Surgery, Gynecology and Obstetrics*, 1908, VII, 495.

YOUNG, HUGH H., M. D. A new instrument for the deposition of ointments into the urethra or bladder.—*Maryland Medical Journal*, 1908, LI, 211.

——— A report of one hundred consecutive perineal prostatectomies without a death; with remarks on the general decrease in the mortality of prostatic operations in recent years.—*Journal of the American Medical Association*, 1908, L, 518.

——— Surgery of the prostate.—*Keen's Surgery*, 1908, IV, 372.

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NOTES ON NEW BOOKS.

Parasitology. A Supplement to the Journal of Hygiene. Edited by GEORGE H. F. NUTTALL, F. R. S., Quick Professor of Biology in the University of Cambridge, and A. E. SHIPLEY, F. R. S., University Lecturer in the Advanced Morphology of the Invertebrates. (*Cambridge: at the University Press.*)

This second number of the new journal is the first we have had for review. It is a well printed and admirably illustrated fasciculus of over 90 pages. Of the seven papers those most interesting to the medical profession are Castellani's, describing an amœbic abscess of the liver in a monkey and the causative amœba for which he proposes the name *Entamœba nuttalli.*

A very interesting article by Nuttall and Graham-Smith, on the mode of multiplication of several species of piroplasma in the circulating blood, and a paper by Nuttall, on the behavior of spirochætæ in *Acouthia lectularia* in which it is shown that the organisms may live several days in the gut at a low temperature, and that in one instance the parasites were transferred from an infected to a normal mouse by the bites of this parasite.

The journal is a credit to the editors and the Cambridge University Press.

Diseases of the Larynx. By HAROLD BARWELL, M. B., Lond., F. R. C. S. (*London: Henry Frowde, and Hodder & Stoughton, 1907.*) *Oxford Medical Publications.*

This small manual on diseases of the larynx covers the ground in a manner similar to that by Waggett on the nose. What we said in the review of the latter could be repeated for this.

The book is small, well printed, and will be acceptable to the student and practitioner of medicine who wishes to get a smattering of the subject. However, the author has no new ideas to present, and this volume simply adds another to this already greatly overburdened field.

Applied Surgical Anatomy. By GEORGE WOLSEY, M. D. Second edition. (*Lea & Febiger, 1908.*)

This book has long been recognized as one of the most useful of the large class to which it belongs. This edition is not merely a reprint of the first edition—the usefulness of which was proved by its exhaustion—but is a real enlargement and revision of the original issue, bringing the volume quite up to date. The recent work, for instance, on the parathyroid glands has been incorporated in the book. On the whole it is doubtful if a better work, in proportion to its size, exists on applied surgical anatomy.

Practical Anæsthetics. By H. EDMUND BOYLE, M. R. C. S., L. R. C. P., Assistant Anæsthetist to St. Bartholomew's Hospital, etc. (*London: Henry Frowde and Hodder & Stoughton, 1907.*) *Oxford Medical Publications.*

This is a very practical and concise work on anæsthetics. The author has purposely avoided the details of the physiology of anæsthesia in order to make the work as practical as possible. After a short but sufficient introductory chapter on the general conditions of anæsthesia, duties of the anæsthetist, examination of the patient, preparation of the patient, apparatus and instruments the anæsthetist should always have at hand, position of the patient, the moving of the patient while under anæsthesia, vomiting, shock and collapse, artificial respiration and after treatment, there follows a series of chapters on nitrous oxide, chloroform, ether, and ethyl-chloride with a brief and well-illustrated description of the methods of administering each.

Very little space is devoted to the open and the semi-open methods of administering ether. He rather discourages the use of these methods by taking the ground that they can be used only in children and are sometimes suitable for exhausted patients.

Chapter VI is devoted to mixtures and sequences. The remaining chapters treat of the selection of the anæsthetics for special cases and to the various positions of the patients while under an anæsthetic.

This book is very useful to both the student and busy practitioner who has not the time to devote to the study of such works as those by Hewett, Buxton, Turnbull, and Patton.

Glandular Enlargement and Other Diseases of the Lymphatic System. By ARTHUR EDMUNDS. (*London: 1908.*)

The author has brought together in a useful way the general knowledge of diseases of the lymphatic glands. He has attempted to make no additions to this knowledge. This presentation of the subject, while clear and interesting, is hardly complete and scientific. Hodgkin's disease, for instance, is dismissed with five scant pages; and very little account is taken of the recent work on the pathology of this disease. One is disappointed to find radical treatment of tuberculous glands of the neck advised by means of multiple transverse incisions; and one shudders to read that when tapping of a hydrocele (in children) fails "a good plan is to puncture the cyst with a fine trocar and cannula, allow fluid to escape, and then to inject 5 or 10 minims of pure carbolic acid."

Clinical Surgery. By DR. PH. BOCKENHEIMER. English Adaptation by C. F. MARSHALL, M. D., F. R. C. S. (*New York: Rebman Company.*)

This work consists of colored reproductions of models of pathological specimens, taken from von Bergmann's clinic. The models were made by Kolbow, in the Pathoplastic Institute, at Berlin. Bockenheimer has written a running commentary on the illustration; but the text forms really a trivial part of the book. Kolbow's models are little short of marvelous; and the four-color reproductions have been excellently done. The result is a series of illustrations—representing the more common pathological conditions met with in surgery—which reproduce the picture in the living subject with very great accuracy. Students are thus provided with a large amount of clinical material which, so far as inspection is concerned, can only be of very great value. Those who wish to familiarize themselves with the *appearance* of surgical-pathological conditions cannot do better (if actual patients are not at hand) than consult this book, the artistic work of which can hardly be too highly praised.

Physicians' Visiting List—1909. Price $1.00.

P. Blakiston's Son & Co. have just issued this annual work, now in its 58th year, and they are to be complimented in arranging so skilfully this most useful pocket note-book for the busy, country practitioner, who is constantly on the road. Other doctors also will find it serviceable. Its size and make-up are both pleasing. It contains various tables of signs, doses, simple rules about incompatability of drugs, poisoning, asphyxia, etc.

Sleeping Sickness Bureau. Bulletin No. 1. (*London: Royal Society, Burlington House, W. October, 1908.*)

The importance of "Sleeping Sickness" as an economical question in Africa is made evident by the publication of this new journal. The first number deals only with the "Chemo-Therapy of Trypanosomiasis" (unfortunately the writer's name is not given). The paper is a résumé of all that is known of this subject. There is no statement as to how often the Bulletin will appear. The editor is the director of the bureau, Dr. A. G. Bag-

shawe, and the publication is "issued under the direction of the Honorary Managing Committee." Its appearance is to be welcomed.

Diseases of the Eye. By STEPHEN MAYOU, F. R. C. S., late Hunterian Professor, Assistant Surgeon and Pathologist, Central London Ophthalmic Hospital. With 119 original Illustrations and 8 color plates. Price $1.50 net. (*London: Henry Frowde, and Hodder & Stoughton, 1908.*) *Oxford Medical Publications.*

A compact, thoroughly up-to-date manual on the diseases of the eye. It appears to be admirably adapted to the requirements of the undergraduate medical student and to afford all that is likely to be needed, as a handy reference book, by the family physician. It fits in very well with the two other special books in this Oxford series, which it has been my pleasure to read and commend, that is, Tod's Disease of the Ear, and Waggett's Diseases of the Nose. It is a pleasure to recommend these manuals to the student who desires to get at the essentials of each branch of special medicine and not to waste time over such parts of the subject as belong more particularly to the specialist. H. O. R.

Ophthalmic Surgery. By JOSEF MELLER, Privatdocent and First Assistant K. K. 11, University Eye Clinic, Vienna. Illustrated. $3.00 net. (*Philadelphia: P. Blakiston's Son & Co., 1908.*)

Dr. Meller's book, as he states in the preface, was written in response to many requests from English-speaking physicians.

The author is so well known among American ophthalmologists as to require no introduction.

The book is profusely illustrated and the illustrations are so well executed as to be self-explanatory. The book is devoted exclusively to methods of operation employed in Fuchs' clinic. Many of these operations were originated by Dr. Meller; others were changed so as to conform to the ideas of the author and his fellow-laborers. While we fear American and English ophthalmologists are not given their full credit, nevertheless the value of the book is not materially impaired by this error of omission. The chapters on "Extirpation of the Lachrymal Sac" are excellent. The author fully describes this delicate operation and the illustrations seems to us to be as perfect as it is possible to have them.

Another "feature" of this work is the chapter on "Glaucoma." It is hard to conceive the subject treated being more carefully and thoroughly reviewed.

The book from the preface to the index is a work of great value and will find a welcome place in the library of the working ophthalmic surgeon. J. B., JR.

Surgical Memoirs and Other Essays. By JAMES G. MUMFORD, M. D., etc. Illustrated. (*New York: Moffat, Yard & Co., 1908.*)

Dr. Mumford is one of the few men in America seriously interested in the history of medicine, and his additions to it are to be valued, especially as furnishing sources of inspiration for others to pursue in more detail the lives of some doctors, whom he has sketched, or to write on other historical questions of medicine and surgery. The field is a large one, and has been but little cultivated. The author is at his best in the lives of Boston worthies about whom much is known, and knowledge still easy of access. Of them he writes with a sincere feeling of respect and admiration, and presents a vivid picture of their surroundings and activities. It is to be hoped that with his broad acquaintance of medical conditions in and around Boston during the past century, Dr. Mumford will give us more of his bright and entertaining essays. The volume is not even in quality; the first section, a "Narrative of Surgery," reprinted from Keen's System of Surgery, shows omissions, and its chapters are not well-balanced; but the longer memoirs are pleasant and agreeable reading. The last three papers might have been left out, as they are remote in subject from the historical studies. The portraits of the doctors written of are an attractive addition to this welcome volume.

Progressive Medicine, Vol. IV. December, 1908. Diseases of the Digestive Tract and Allied Organs, the Liver and Pancreas—Diseases of the Kidneys—Surgery of the Extremities, Tumors, Surgery of Joints, Shock, Anæsthesia and Infections—Genito-urinary Diseases—Practical Therapeutic Referendum. (*Philadelphia and New York: Lea & Febiger, 1908.*)

The contributors to this volume are all well known; four are Americans, Belfield, Bloodgood, Edsall and Lewis, and the fifth, John Rose Bradford, of England. The longest and only illustrated chapter is Bloodgood's, on the Surgery of the Extremities, etc.; this seems natural, as there is more advance made in surgery than in medicine; but the chapters are evenly proportioned, and they are all well prepared. As a "review of reviews," Progressive Medicine is a useful work for all busy practitioners.

Human Foods and Their Nutritive Value. By HARRY SNYDER, B. S., Professor of Agricultural Chemistry, University of Minnesota, etc. Price, $1.25. (*New York: The Macmillan Company, 1908.*)

This is a small work, adapted to the needs of the layman, as well as students who mean to be doctors, and of nurses; for them it is well written. The author describes the constitution of the simpler foods, also their comparative cost and nutritive values, and adds a few laboratory experiments of the simplest nature. It is practical and will doubtless find a ready sale among those who do not want an advanced work on this subject; it is only a primer.

Bier's Hyperemic Treatment in Surgery, Medicine and the Specialties. A Manual of its Practical Application. By WILLY MEYER, M. D., Professor of Surgery at the New York Post-Graduate Medical School and Hospital, Attending Surgeon to the German Hospital, etc.; and PROF. DR. VICTOR SCHMIEDEN, Assistant to Professor Bier, University of Berlin, Germany. Illustrated. (*Philadelphia and London: W. B. Saunders Company, 1908.*)

In this little book, which is the first one on this subject published in the United States, hyperemic treatment is presented in a most attractive manner. In fact one is almost persuaded that no other treatment is necessary in the majority of surgical troubles, while even medical cases and those requiring the specialties are included, although to a lesser extent.

The principal points in technic are emphasized and the explanations are clear. The illustrations are excellent, the book is well-printed and the marginal notes are very satisfactory. On the whole it is thoroughly worth reading, and while some of the claims for this method of treatment are rather extravagant, nevertheless there is no doubt that the production of hyperemia, both by obstruction and by hot air, is a most valuable addition to our therapeutic resources. J. S. D.

A Text-Book of Surgical Anatomy. By WILLIAM FRANCIS CAMPBELL, M. D., Professor Anatomy, Long Island College Hospital, etc. With 319 original illustrations. (*Philadelphia and London: W. B. Saunders Company, 1908.*)

This book is divided into six parts as follows: Head and Neck, Thorax, Upper Extremity, Abdomen and Pelvis, Spine and Lower Extremity.

The illustrations are far above the average, many of them being constructed in a striking and unusual manner. They aid materially in interpreting the text.

Although descriptions are for the most part brief, they cover quite thoroughly the subject of surgery from an anatomical standpoint.

The book will be very useful in its field, and would be worth having for its plates alone. J. S. D.

Fiske Fund Prize Dissertation No. LI. Has Surgical Treatment Lessened the Mortality from Appendicitis? By FRANK P. VALE, M. D., Washington, D. C. (*Providence: Snow & Farnham Company, Printers, 1908.*)

Dr. Vale is to be congratulated on having secured this prize. He has analyzed and tabulated in statistical form nearly 56,000 cases of appendicitis, and comes to the conclusion that taking the operations all over the world the mortality is to-day between 7 and 8 per cent. To those interested in the study of the problem under discussion, this essay will prove invaluable.

An Analytical Index of Volumes I to X of The Medical Review and a Digest of the Facts Important to the Practitioner in the Medical Periodicals of the World. 1898-1907. Price, 7/6. (*London: The Medical Review, 66 Fensbury Pavement, E. C., 1908.*)

As this Index appears to be only of The Medical Review, the second half of the title is somewhat misleading. With the aid of the preface the method of indexing will be readily understood; and no doubt this volume will be of service to readers of The Review. Why "anterior tibial nerve" should be indexed under the first word is not evident, nor apparently in accord with the rules set forth. And there are other titles which would have been differently indexed by the reviewer. The task of indexing is a difficult one, and as much labor has been put into this work, and as it is on the whole clear, it deserves a grateful welcome.

International Clinics, Vol. III. Eighteenth Series. (*Philadelphia and London: J. B. Lippincott Company, 1908.*)

Thirteen of the twenty-seven contributors to this volume are foreigners; the rest are Americans, showing how evenly apportioned are the articles between the old and the new world. Treatment, Medicine, Surgery, Gynæcology, Pædiatrics, Orthopædics, Psychiatry, Neurology, Ophthalmology, Rhinology and Pathology all furnish their fair quota of papers. One of the best results of the Clinics is that it introduces the American doctor who does not read a foreign language to the best work that is being done in Europe, and almost all the writers present their subjects in a lucid and attractive style, so that the subscriber to the volume should be well satisfied with it.

An Alabama Student and Other Biographical Essays. By WILLIAM OSLER, M. D., F. R. S. (*London: Henry Frowde and Hodder & Stoughton, 1908.*) *Oxford Medical Publications.*

In this book Dr. Osler has collected together thirteen of his historical and biographical essays delivered at various times from 1895 to 1906. A pleasing feature is the dedication to Dr. Welch, with the words of which everyone who knows him will cordially agree. The book contains thirteen chapters, each dealing with one who had something to do with medicine. For some, such as Keats and Locke, the medical life was overshadowed by other activities for which they are better known; yet it is well that we should be reminded that they belonged to the profession.

The essay, which gives the title to the book, is an account of the life of Dr. John Y. Bassett, of Huntsville, Alabama. Coming by chance across some of his articles, published about 1850, which suggested something unusual in the writer, Dr. Osler was prompted to find out more about him. We have the result in this essay. Dr. Bassett worked abroad in the thirties, especially in Paris, to which so many Americans went at that time, and there are many interesting extracts from his letters. He evidently felt the need of a view of a wider horizon than his home surroundings offered and went abroad some years after he had been established in practice. The sketch of Thomas Dover is especially interesting, as in addition to his work in medicine he was also a buccaneer, and on one of his expeditions rescued Alexander Selkirk (Robinson Crusoe) in 1710. Of the essays dealing with American men, there are five, namely, those on Oliver Wendell Holmes, Elisha Bartlett, Beaumont, William Pepper and Alfred Stillé, in addition to one on the influence of Louis on American medicine. There are also articles on Sir Thomas Browne and Fracastorius, the latter celebrated for his early description of syphilis. The last essay of the book deals with Harvey, being the Harveian oration at the College of Physicians in 1906, in which he has taken up especially the study of the growth of truth as exemplified by Harvey's discovery.

It is not possible to review all these essays in detail. They are of interest not only to physicians, but also to the general reader. It is significant how frequently this book has been reviewed in the daily papers and literary journals. To praise it is unnecessary, as we are all familiar with the character of Dr. Osler's literary work. Not the least of the thanks which many of us owe him, is gratitude for the stimulus which he has given to take an interest in the history of medicine.

Tuberculosis in the United States. Bureau of the Census, S. N. D. NORTH, Director. Department of Commerce and Labor.

This special pamphlet was prepared for the International Congress on Tuberculosis at Washington, D. C., this year. It will appear later in the Annual Report of the United States on Mortality Statistics of 1907, but its appearance at this moment was of real value, as showing to those who had come to Washington to study this disease in all its aspects the status of affairs in the United States. Like all the papers coming from the Census Bureau under Dr. North's direction, it has been admirably prepared, and is a report that will interest very many. It is furnished with numerous charts and diagrams.

Therapeutics: Its Principles and Practice. By HORATIO C. WOOD, M. D., LL. D., etc. Thoroughly revised and rewritten by HORATIO C. WOOD, JR., M. D., etc. 14th edition. (*Philadelphia and London: J. B. Lippincott Company.*)

The mere fact that this work on therapeutics has gone through fourteen editions since its original appearance in 1875 shows that it has been found useful by the medical profession.

The general utility of the book seems to rest chiefly upon three factors: (1) the consideration of the pharmacological action of the drugs; (2) the therapeutic value of the drugs and the mode of administration, and (3) the fairly extensive references to the literature which are to be found at the end of each chapter.

The attempt has been made to bring the work up to date. Among other things, a short section on opsonins has been added, the wisdom of which may be doubted by some. That bacterial vaccines are of value in certain infections is quite generally accepted; that the estimation of the opsonic index furnishes a reliable guide for the therapeutic use of vaccines is disputed.

Dr. Wood's volume is too extensively known to need detailed criticism. The press-work is well executed.

Gonorrhœa in Women. By PALMER FINDLEY, M. D. (*St. Louis, Mo.: C. V. Mosby Medical Book and Publishing Company, 1908.*)

This is a loosely written, discursive treatise of the subject of but slight value. The work of the proofreader is not good, and in the bibliography there are a shocking number of misprints; besides lacking in conformity as to titles, dates and subjects are both omitted, and in fact it could hardly be worse compiled. *Gonorrhoea* is thus written throughout the work; it should be *gonorrhœa*, if the final *o* is retained.

BOOKS RECEIVED.

Gynecology and Abdominal Surgery. Edited by Howard A. Kelly, M. D., F. R. C. S. (Hon. Edin.) and Charles P. Noble, M. D., S. D. Illustrated by Hermann Becker, Max Brödel and others. Volume Two. 1908. 4to. 862 pages. W. B. Saunders Company, Philadelphia and London.

Applied Surgical Anatomy. Regionally Presented. By George Woolsey, A. B., M. D. Second edition, enlarged and thoroughly revised. With 200 illustrations, including 59 plates, mostly colored. 1908. 8vo. 601 pages. Lea & Febiger, New York and Philadelphia.

Gonorrhœa in Women. By Palmer Findley, M. D. 1908. 4to. 112 pages. C. V. Mosby, St. Louis, Mo.

Atlas of Clinical Surgery, with Special Reference to Diagnosis and Treatment. By Dr. Ph. Bockenheimer. English adaptation by C. F. Marshall, M. D., F. R. C. S. With 150 colored figures from models by F. Kolbow in the Pathoplastic Institute of Berlin. Three Volumes. 1908. 4to. Rebman Company, New York.

Diseases and Surgery of the Genito-Urinary System. By Francis S. Watson, M. D., assisted by John H. Cunningham, Jr., M. D. Volume I. With 339 engravings and 23 colored plates. Volume II. With 115 engravings and 24 colored plates. 1908. 8vo. Lea & Febiger, Philadelphia and New York.

Diseases of the Skin and the Eruptive Fevers. By Jay Frank Schamberg, A. B., M. D. Fully illustrated. 1908. 8vo. 534 pages. W. B. Saunders Company, Philadelphia and London.

Therapeutics of the Circulation. Eight Lectures Delivered in the Spring of 1905 in the Physiological Laboratory of the University of London. By Lauder Brunton, Kt., M. D., D. Sc., LL. D. (Edin.), LL. D. (Aberd.), F. R. C. P., F. R. S. With 240 illustrations. 1908. 8vo. 280 pages. P. Blakiston's Son & Co., Philadelphia.

A Manual of Bacteriology, Clinical and Applied. By R. Tanner Hewlett, M. D., F. R. C. P., D. P. H. (Lond.). Third edition. 1908. 8vo. 638 pages. J. & A. Churchill, London. P. Blakiston's Son & Co., Philadelphia.

A Handbook of Suggestive Therapeutics, Applied Hypnotism, Psychic Science. By Henry S. Munro, M. D. Second edition. 1908. 8vo. 360 pages. C. V. Mosby, St. Louis, Mo.

Arteriosclerosis: Etiology, Pathology, Diagnosis, Prognosis, Prophylaxis and Treatment. By Louis M. Warfield, A. B., M. D. With an Introduction by W. S. Thayer, M. D. Eight original illustrations. 1908. 12mo. 172 pages. C. V. Mosby, St. Louis, Mo.

The Surgery of the Ear. By Samuel J. Kopetzky, M. D. Illustrated with sixty-three half-tones and line drawings, eight charts and four colored plates. 1908. 8vo. 368 pages. Rebman Company, New York.

On Infantilism from Chronic Intestinal Infection. Characterized by the Overgrowth and Persistence of Flora of the Nursling Period. By C. A. Herter, M. D. 1908. 12mo. 118 pages. The Macmillan Company, New York.

Action de la Contraction Utérine sur l'Oeuf Humain. Phénomènes de la Grossesse et du Travail. Par Dr. Paul Bouquet. 1908. 4to. 175 pages, 44 plates. G. Steinheil, Paris.

Proceedings of the American Medico-Psychological Association. At the sixty-third annual meeting held in Washington, D. C., May 7-10, 1907. 8vo. 356 pages. Published by American Medico-Psychological Association.

State Board of Health of the State of Michigan. Thirty-fifth Annual Report of the secretary for the fiscal year ending June 30, 1907. 8vo. 180 pages. 1908. Lansing, Michigan.

American Proctologic Society. Transactions of the Tenth Annual Meeting held at Chicago, Ill., June 1-2, 1908. 8vo. 146 pages.

A Dictionary of Medical Treatment. By Arthur Latham. 1908. 12mo. 325 pages. P. Blakiston's Son & Company, Philadelphia.

Ticks. A Monograph of the Ixodoidea. By George H. F. Nuttall, M. A., M. D., Ph. D., Sc. D., F. R. S., Cecil Warburton, M. A., F. Z. S., W. F. Cooper, B. A., F. Z. S., F. L. S., and L. E. Robinson, A. R. C. Sc. (Lond.). 1908. 4to. 104 + 35 pages. University Press, Cambridge.

Scientific Memoirs. New Series. No. 32. By Officers of the Medical and Sanitary Departments of the Government of India. *An Enquiry on Enteric Fever in India.* Carried out at the Central Research Institute, Kasauli, under the direction of Lieutenant Colonel D. Semple, M. D., and Captain E. D. W. Greig, M. D. 1908. Fol. 108 pages. Superintendent Government Printing, Calcutta.

Third Scientific Report on the Investigations of the Imperial Cancer Research Fund. Under the direction of the Royal College of Physicians of London and the Royal College of Surgeons of London. By E. F. Bashford. 1908. 4to. 484 pages. Taylor & Francis, London.

Transactions of the Maine Medical Association. 1908. Volume XVI. Part II. 8vo. Portland.

Human Foods and Their Nutritive Value. By Harry Snyder, B. S. 1908. 12mo. 362 pages. The Macmillan Company, New York.

Dr. Walter Bayley and His Works, 1529-1592. By D'Arcy Power, F. S. A. [Reprinted from Volume 90 of the "Medico-Chirurgical Transactions."] 1907. The Royal Medical and Chirurgical Society of London.

Surgical Memoirs and Other Essays. By James G. Mumford, M. D. Illustrated. 1908. 8vo. 358 pages. Moffat, Yard & Company, New York.

THE JOHNS HOPKINS HOSPITAL BULLETIN.

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